30 west superior street / duluth, minnesota 55802-2093 / fax: 218-723-3955 /www.allete.com

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Senior Attorney
218-726-3963
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April 15, 2013

VIA ELECTRONIC FILING

Dr. Burl W Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101

Re: Application for a Route Permit By Minnesota Power
Deer River Transmission Project
MPUC Docket No. E015/TL-13-68

Dear Dr. Haar:

Under a separate eFile submission, dated today, please find the Minnesota Power ("Applicant") Route Permit Application ("Application) for a 1.0 mile new 115 kV high voltage transmission line ("HVTL"), a 0.3 mile 230 kV HVTL and associated substation located east of the city of Deer River ("Deer River Project"). The Application details the Applicants' proposed location of the Deer River Project, located in Itasca County.

The Route Permit Application is submitted under the Alternative permitting process of Minn. Rules 7850.2800 to 7850.3900 and Minn. Stat. 216E.04. An electronic copy on CD ROM and 6 paper copies of the Application have been provided to Suzanne Steinhauer of the Department of Commerce, Energy Facility Permitting staff.

Minnesota Power awaits an invoice from Department of Commerce for processing the route permit application (as required by Minn. Rules 7850.1800 and Minn. Stat. 216E.18).

Please direct any questions you may have with respect to the filing to Daniel McCourtney of Minnesota Power at 218-355-3515

Sincerely,

David R. Moeller

DRM/KJC:jy
cc: Deborah Pile, DOC-EFP

IN THE MATTER OF MINNESOTA POWER'S ROUTE PERMIT APPLICATION UNDER THE ALTERNATIVE PERMITTING PROCESS FOR THE PROPOSED MINNESOTA POWER DEER RIVER PROJECT- ITASCA COUNTY, MINNESOTA

MPUC Docket No. E015/TL-13-68

CERTIFICATE OF SERVICE

Jill N. Yeaman certifies that on the 15th day of April, 2013, she efiled a true and correct copy of Minnesota Power's **Application to the Minnesota Public Utilities Commission for a Route Permit,** with appendices, via eDockets (www.edockets.state.mn.us) and served the same on the attached Official Service List on file with the Minnesota Public Utilities Commission for Docket No. E015/TL-13-68.

/s/ Jill N. Yeaman
Jill N. Yeaman

MINNESOTA POWER

APPLICATION TO THE MINNESOTA PUBLIC UTILITIES COMMISSION FOR A ROUTE PERMIT

DEER RIVER HVTL PROJECT

115 KV TRANSMISSION LINE, 230 KV TRANSMISSION LINE AND SUBSTATION UPGRADE

Alternative Permitting Process
PUC Docket No. E015/TL-13-68

April 15, 2013

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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 Executive Summary

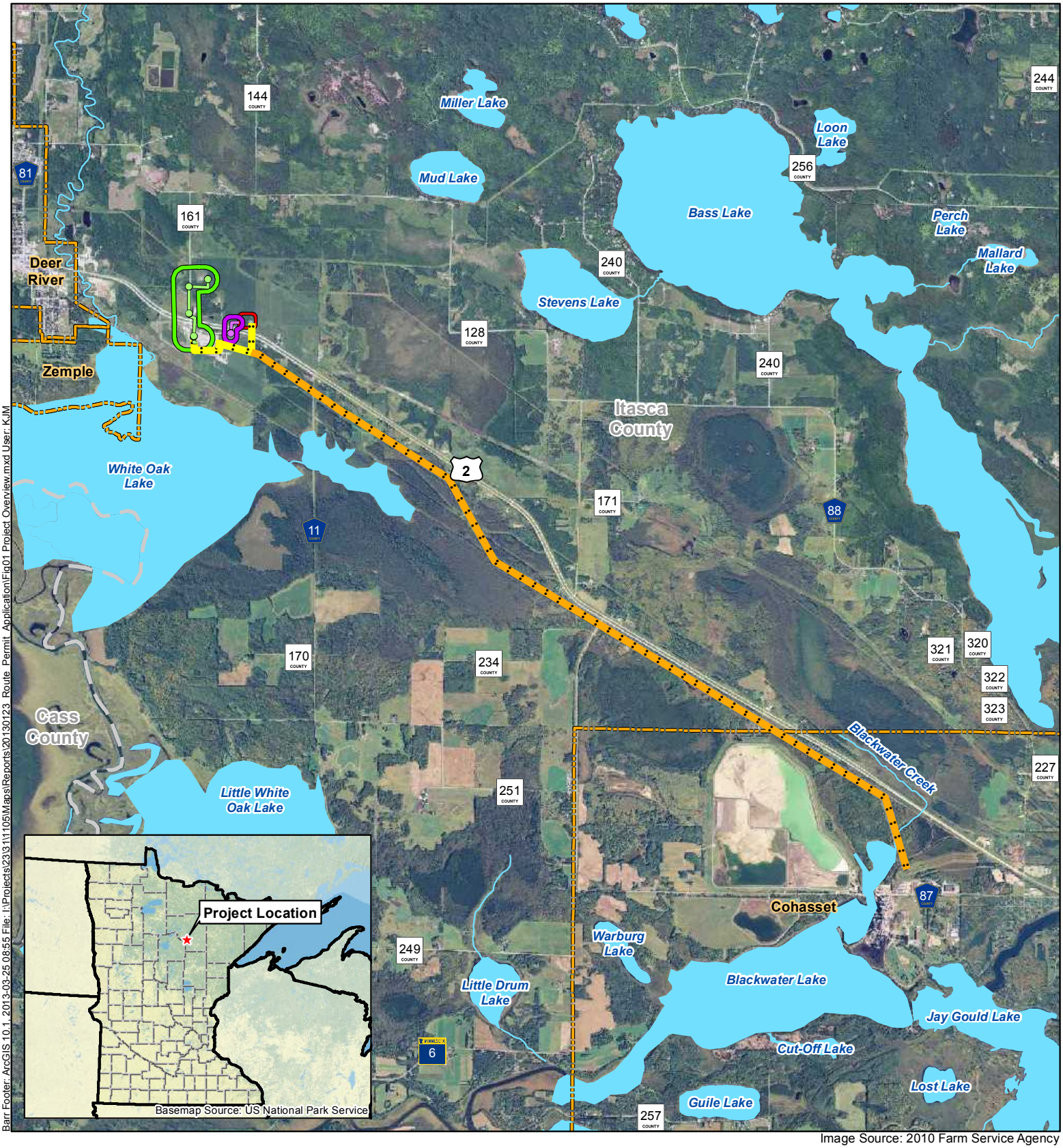
1.1 Proposal Summary

Minnesota Power, a division of ALLETE, Inc., (Minnesota Power or the Applicant) submits this application (Application) for a Route Permit to the Minnesota Public Utilities Commission (MPUC or Commission) pursuant to Minnesota Statutes Chapter (Minn. Stat.) 216E and Minnesota Rules (Minn. R.), chapter 7850 (Appendix A). A Route Permit is requested to build an approximately 1.0-mile 115 kilovolt (kV) high voltage transmission line (HVTL) and an approximately 0.3-mile double-circuit 230 kV HVTL. The Route Permit is also requested to restructure and reconductor a 0.9 mile portion of an existing 115 kV HVTL, and remove Minnesota Power's existing Deer River 115/23 kV substation and replace with a new Minnesota Power Zemple 230/115/23 kV substation. An existing 7.5 mile long 115 kV HVTL tap would also be taken out of service and removed.

The proposed Project is located just east of the City of Deer River, Minnesota, adjacent to U.S. Highway 2 (US Hwy 2) and near existing industrial land use, a commercial development and some residential land. The proposed 1.0-mile 115 kV HVTL will extend from an existing substation north of US Hwy 2 to a point near an existing industrial facility substation south of US Hwy 2. The proposed 0.3-mile double-circuit HVTL will tap an existing 230 kV HVTL south of US Hwy 2 and extend to the proposed Zemple Substation Location north of US Hwy 2. Under the proposed project, Minnesota Power would remove Minnesota Power Deer River 115/23 kV distribution substation and replace with a new Zemple 230/115/23 kV substation at the same location. The transformer and substation equipment from the existing substation will be removed and switched over to the newly constructed substation.

The proposed Project is needed to address growing load in the Deer River, Minnesota area. The proposed Project will complete a circuit in the Project area, allowing seven miles of existing 115 kV HVTL east of the project area between Deer River and Cohasset to be taken out of service and removed. An overview of the proposed Project components is provided in Figure 1. The Project will improve electrical service to current customers and expected load growth.

The proposed route widths and right-of-way (ROW) requirements vary for the proposed new and rebuilt HVTL segments. The proposed rebuild of the existing 115 kV HVTL will occur within the existing 100-foot ROW. The proposed new 115 kV HVTL will require a 100-foot ROW. Due to the unique engineering challenges associated with maintaining appropriate clearances with existing infrastructure in the area (natural gas pipelines, existing 230 kV HVTL, US Hwy 2, the Applicant is requesting a 1000-foot route width to allow adequate flexibility in developing a final alignment for the proposed new 115 kV HVTL. The proposed 230 kV HVTL will require a 130-foot ROW. The Applicant is requesting a 500-foot route width to allow adequate flexibility as the Applicant works with landowners and addresses engineering constraints in developing a final alignment for the proposed 230 kV HVTL. Figure 2 shows the Applicant's proposed Route including current preferred alignments within the proposed Route width and the proposed Substation Location. Detailed maps showing resources and environmental features along the proposed Routes and near the proposed Substation Location are provided in Appendix B.



Barr Footer: ArcGIS 10.1, 2013-03-25 08:55 File: I:\Projects\23131105\Maps\Reports\20130123 Route Permit Application\Fig01 Project Overview.mxd User: KJM

Figure 1

PROJECT OVERVIEW
Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

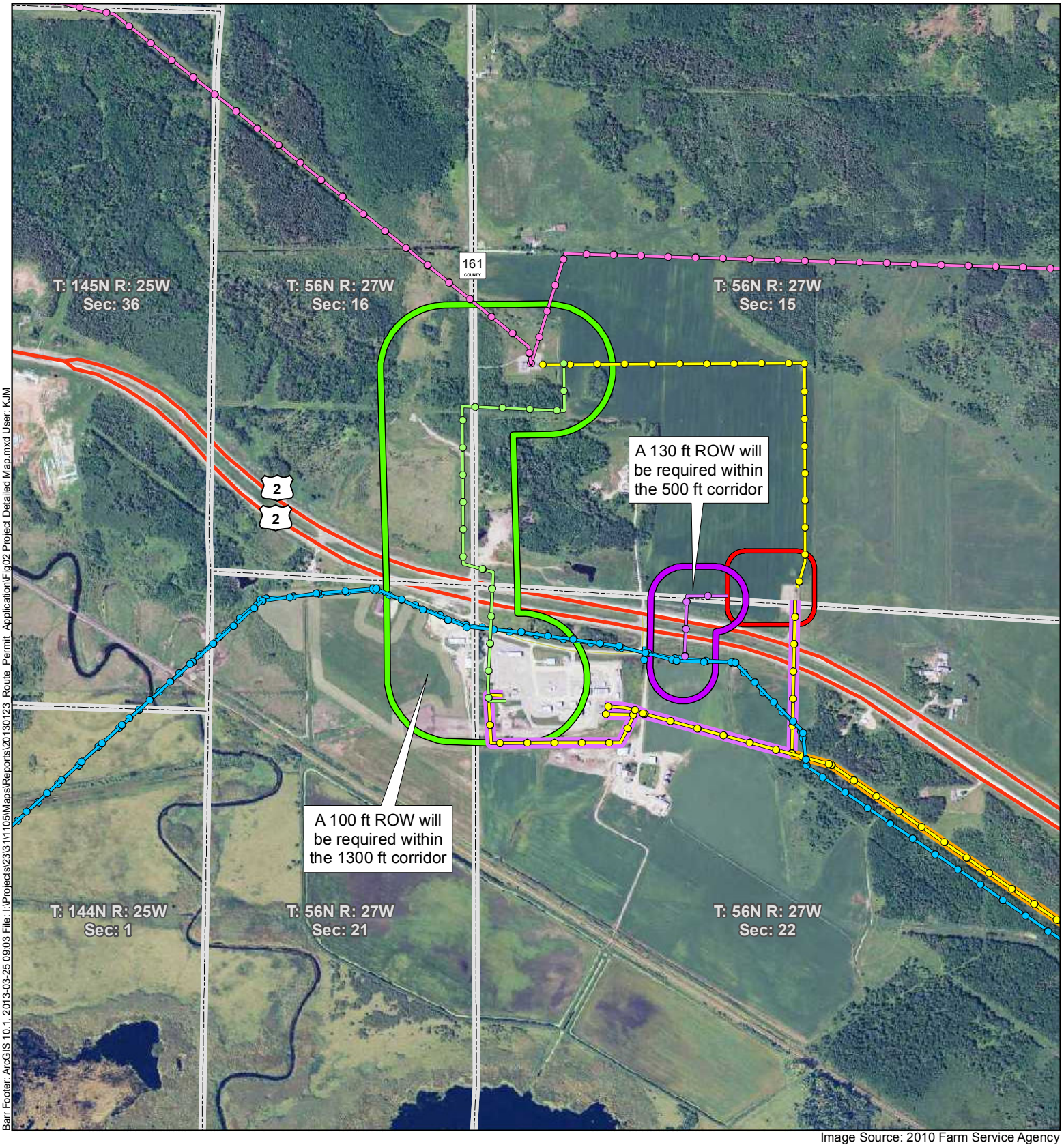


Image Source: 2010 Farm Service Agency

Barr Footer: ArcGIS 10.1, 2013-03-25 09:03 File: I:\Projects\23\11105\Maps\Reports\20130123_Route_Permit_Application\Fig02 Project Detailed Map.mxd User: KJM

- Existing 115kV Line
- Existing 69kV Line
- CapX2020 230kV Line
- 115 kV HVTL Proposed for Removal
- Proposed 115 kV Rebuild
- Proposed New 115kV Alignment
- Proposed 115 kV HVTL Route
- Proposed New 230kV Alignment
- Proposed 230 kV HVTL Route
- Proposed Substation Location
- PLS Section

N

0 500 1,000 2,000 Feet

Figure 2

PROJECT DETAILED MAP
Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

This Application is submitted pursuant to the Alternative Permitting Process outlined in Minn. R., parts 7850.2800 to 7850.3900. The proposed 115 kV HVTL, 230 kV HVTL, and associated facilities is eligible for consideration under the Alternative Permitting Process under Minn. Stat. § 216E.04, subd. 2(4), and Minn. R., parts 7850.2800 to 7850.3900 (*see* Minn. R., part 7850.2800, subpart 1(D)) because the proposed Project is less than five miles in length. The Applicant respectfully requests that the Commission approve the proposed Routes and proposed Substation Location, and authorize a route width of 1000 feet for the 115 kV HVTL and 500 feet for the 230 kV HVTL (Figure 2 and Appendix B)

1.2 Completeness Checklist

The content requirements for an application with the Commission under the Alternative Permitting Process are identified under Minn. Stat. § 216E.04, subd. 2(3) and Minnesota Rules, parts 7850.2900 and 7850.1700. The rule requirements are listed in Table 1 with references indicating where the information can be found in this Application.

Table 1 Completeness Checklist

Authority	Required Information	Route Permit Application Section
Minn. R., part 7850.2800, subparts 1(C) and (D)	**Subpart 1. Eligible Projects**	
	An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7850.2800 to 7850.3900 instead of the full permitting procedures in part 7850.1700 to 7850.2700: (C) for HVTLs of between 100 and 200 kV; (D) HVTLs in excess of 200 kV and less than five miles in length.	2.5
Minn. R., part 7850.2800, subpart 2	**Subpart 2. Notice to Commission**	
	An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7850.2800 to 7850.3700, shall notify the PUC of such intent, in writing, at least 10 days before submitting an application for the projects.	2.6 and Appendix A
Minn. R., part 7850.3100	**Contents of Application (alternative permitting process)**	
	The applicant shall include in the application the same information required in part 7850.1900, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them.	4.3

Authority	Required Information	Route Permit Application Section
Minn. R., part 7850.1900, subpart 2 (applicable per Minn. R., part7850.3100)	**Route Permit for HVTL**	
A.	A statement of proposed ownership of the facility at the time of filing the application and after commercial operation	2.1
B.	The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the Route Permit may be transferred if transfer of the Route Permit is contemplated.	2.3
C.	At least two proposed routes for the proposed HVTLs and identification of the preferred route and the reasons for the preference.	Not applicable, per Minn. R., part 7850.3100 However, *see* 4.3.
D.	A description of the proposed HVTL and all associated facilities including the size and type of the HVTL.	3.2, 4.1, 4.4, 5.1.1
E.	The environmental information required under part 7850.1900, subpart 3	Section 6.0 see Minn. R., part 7850.1900, subpart 3 (A) - (H)
F.	Identification of land uses and environmental conditions along the proposed routes.	Section 6.0
G.	The names of each owner whose property is within any of the proposed routes for the HVTL.	Appendix C
H.	United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the HVTL on all proposed routes.	Appendix B
I.	Identification of existing utility and public ROWs along or parallel to the proposed routes that have the potential to share ROW, the land used by a public utility (as for a transmission line), with the proposed line.	4.2.2, 5.1.3
J.	The engineering and operational design concepts for the proposed HVTL, including information on the electric and magnetic fields of the transmission line.	Section 5.0
K.	Cost analysis of each route, including the costs of constructing, operating, and maintaining the HVTL that are dependent on design and route.	3.5, 5.1.7
L.	A description of possible design options to accommodate expansion of the HVTL in the future.	4.5
M.	The procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the HVTL.	5.1.3-5.1.6
N.	A listing and brief description of federal, state, and local permits that may be required for the proposed HVTL.	7.6

Authority	Required Information	Route Permit Application Section
O.	A copy of the Certificate of Need or the certified HVTL list containing the proposed HVTL or documentation that an application for a Certificate of Need has been submitted or is not required.	2.4 Not applicable, per Minn. Stat. § 216B.2421, subd. 2(3) and 216B.243
Minn. R., part 7850.1900, subpart 3	**Environmental Information**	
A.	A description of the environmental setting for each site or route.	6.1
B.	A description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation and public services.	6.2
C.	A description of the effects of the facility on land-based economies, including but not limited to, agriculture, forestry, tourism, and mining.	6.3
D.	A description of the effects of the facility on archaeological and historic resources.	6.4
E.	A description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna.	6.5
F.	A description of the effects of the facility on rare and unique natural resources.	6.6
G.	Identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route.	Section 6.0
H.	A description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigation measures.	Section 6.0

2.0 Introduction

2.1 Statement of Ownership

The proposed 115 kV HVTL and associated facilities will be constructed, owned and operated by Minnesota Power. This proposed 230 kV HVTL will follow the same ownership model as the Bemidji to Grand Rapids 230 kV line, with multiple entities with different percentage ownership. The anticipated ownership breakdown is 13% for Great River Energy, 9.3 % for Minnesota Power, 31.5% for Minnkota Power Cooperative, 20% for Otter Tail Power Company, and 26.2% for Northern States Power. Minnesota Power, a division of ALLETE Inc., is an investor-owned utility headquartered in Duluth, Minnesota. The Company provides electricity in a 26,000-square-mile electric service territory located in northeastern Minnesota. Minnesota Power supplies retail electric service to 141,000 customers in northern Minnesota, and wholesale electric service to 16 municipalities in Minnesota and two private utilities in Wisconsin. The proposed Project will be located in Minnesota Power's service area and will connect to Minnesota Power's existing transmission facilities. Minnesota Power's transmission network is interconnected with the regional transmission grid to promote reliability and Minnesota Power is a member of the Midwest Reliability Organization and the Midwest Independent Transmission System Operator.

2.2 Requested Action

This Application is submitted under the Alternative Permitting Process under Minn. Stat. § 216E.04, subd. 2(4) and Minn. R., parts 7850.2800 to 7850.3900 (*see* Minn. R., part 7850.2800, subpart 1(D)). While the rules do not require consideration of alternate routes in the Application (*see* Minn. R., part 7850.3100), the Applicant's evaluation of alternatives during the development of the proposed Route and proposed Substation Location is contained in this Application (Section 4.3).

For reasons identified in subsequent sections of this application, the Applicant prefers the proposed Routes for constructing the proposed 115 kV and 230 kV HVTLs and the proposed Substation Location for construction of the new Zemple 230/115/23 kV substation (Figure 2). The Applicant respectfully requests that the Commission approve the proposed Routes and proposed Substation Location, and authorize a route width of 1000 feet for the 115 kV HVTL and 500 feet for the 230 kV HVTL (Appendix B).

This Application demonstrates that construction of the proposed Project along the Proposed Routes and proposed Substation Location will comply with the applicable standards and criteria set out in Minn. Stat. § 216E.03, subd. 7 and Minn. R., part 7850.4100. The proposed Project will support the State's goals to conserve resources, minimize environmental and human settlement impacts and land use conflicts, and ensure the State's electric energy security through the construction of efficient, cost-effective infrastructure.

2.3 Permittee

The permittee for the proposed Project is:

Permittee:	Minnesota Power
Contact:	Daniel McCourtney Siting and Permitting Analyst
Address:	Minnesota Power 30 West Superior Street Duluth, MN 55802
Phone:	(218) 355-3515
E-mail:	dmccourtney@ALLETE.com

2.4 Certificate of Need

Minn. Stat. § 216B.243, subd. 2 states that "no large energy facility" shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Commission. The proposed Project does not meet the definition of a "large energy facility" under Minn. Stat. § 216B.2421. While the proposed Project is a HVTL with a capacity of 100 kV or more, it is not more than 10 miles long in Minnesota and it does not cross a state line (Minn. Stat. § 216B.2421 subd. 2(3)). Furthermore, while a portion of the proposed Project is a HVTL with a capacity of 200 kV or more, the 230 kV HVTL is less than 1,500 feet in length (Minn. Stat. § 216B.2421 subd. 2(4)). Therefore, a Certificate of Need is not required for the proposed Project.

2.5 Route Permit, Alternative Permitting Process

The Minnesota Power Plant Siting Act (PPSA) states that no person may construct a HVTL without a Route Permit from the Commission (Minn. Stat. § 216E.03, subd. 2). Under the PPSA, an HVTL is considered to be a transmission line that is 100 kV or more and is greater than 1,500 feet in length (Minn. Stat. § 216E.01, subd. 4). The proposed Project is capable of operating at more than 100 kV and is greater than 1,500 feet in length and, therefore, a Route Permit is required from the Commission prior to construction. The proposed Project qualifies for review under the Alternative Permitting Process authorized by Minn. Stat. § 216E.04, subd. 2(4) and Minn. R., part 7850.2800, subparts 1(C) and (D). Accordingly, the Applicant is following the provisions of the Alternative Permitting Process outlined in Minn. R., parts 7850.2800 to 7850.3900 for this proposed Project.

2.6 Notice to the Commission

The Applicant notified the Commission on January 28, 2013, by letter sent via the U.S. Postal Service and e-filed that the Applicant intends to use the Alternative Permitting Process for the proposed Project.

This letter complies with the requirement of Minn. R., part 7850.2800, subpart 2, to notify the Commission of this election at least 10 days prior to submitting an application for a Route Permit. A copy of the letter is attached in Appendix A.

3.0 Proposed Project Information

3.1 Proposed Project Location

The proposed Project is located in west central Itasca County, Minnesota, near the City of Deer River. Figure 1 shows an overview of the Project area. The proposed Route and the proposed Substation Location are shown in Figure 2. More detailed overview maps of the Project area are included in Appendix B. Table 2 identifies the detailed location information for the proposed Project.

Table 2 Detailed Project Location

Township	Range	Section	County
56N	27W	15	Itasca
56N	27W	16	Itasca
56N	27W	21	Itasca
56N	27W	22	Itasca

3.2 Project Proposal

As shown in Figure 2, the Applicant is proposing to build 1.0-mile 115 kV HVTL, a double-circuit 0.3-mile 230 kV HVTL, a substation near Deer River, Minnesota, and restructure and reconductor 0.9-mile of an existing 115 kV HVTL. The proposed Project will allow the removal of approximately seven miles of existing 115 kV transmission line east of the Project area between the cities of Deer River and Cohasset. The key components of the proposed Project include:

- A new 1.0 mile 115 kV HVTL would be built originating from an existing 115 kV HVTL north of Hwy 2 and terminating to the south at an Enbridge electrical substation (green corridor and centerline).
- A new 0.3-mile double circuit 230 kV HVTL would be built between the existing 230 kV HVTL south of Hwy 2 and the proposed Zemple Substation (purple corridor and centerline).
- A 0.9-mile portion of an existing 115 kV HVTL would be restructured and reconductored (Lavender and yellow T-Line)
- Minnesota Power's existing Deer River 115/23 kV Substation would be removed and replaced with a new Minnesota Power Zemple 230/115/23 kV Substation in the same location (red polygon).
- An existing 7.5-mile long 115 kV HVTL tap would be taken out of service and removed (yellow and orange line).

Additional detail regarding each of these components is provided in Section 4.0.

3.3 Need for Project

The Deer River area is currently served by a single 7.5 mile long 115 kV line (the Deer River Tap). This tap has multiple load-serving taps on it. Because all the power required to serve these customers must flow on the Deer River Tap, the line experiences high power flows under certain system conditions. Because of its age and condition, MP has reason to believe that this line may be approaching or exceeding its thermal capacity at times. Anticipated expansion at a large industrial facility will further load the line, exacerbating this issue. Due to the radial arrangement of the Deer River Tap and the outage restrictions associated with this industrial facility, performing maintenance or upgrades on the line is very difficult and generally must be done while the line is energized. As an alternative to rebuilding the Deer River Tap, the proposed Deer River Project provides significantly improved reliability, constructability and long-term load-serving capability. The proposed project will also enhance MP's ability to operate and maintain the transmission system in the Deer River area for the foreseeable future.

3.4 Project Schedule

Construction of the proposed Project is expected to begin in the fourth quarter of 2013, and the Applicant anticipates a third quarter 2015 in-service date for the proposed facilities. Table 3 provides an estimated permitting and construction schedule summary for the proposed Project. This schedule is based on information available at the date of this filing and planning assumptions that balance the timing of implementation with the availability of crews, materials, and other practical considerations. This schedule may be revised as further information is developed.

Table 3 Estimated Project Schedule

Project Task	Date
File Route Permit Application (Application) with the Commission	2nd Quarter 2013
Route Permit Review Process Complete	4th Quarter 2013
Begin Transmission Line and Substation Construction	1st Quarter 2014
In-Service Date	3nd Quarter 2015

3.5 Project Costs

The Applicant estimates that the proposed Project construction will cost approximately $ 13,820,000. A more detailed breakdown of the estimated proposed Project cost is shown in Table 4.

Table 4 Estimated Project Cost

Project Item	Cost
115 kV Transmission Line Facilities	$ 2,760,000
230 kV Transmission Line Facilities	$ 480,000
Zemple Substation and removal of existing Deer River sub	$ 10,000,000
Removal of Existing 115 kV Line Facilities	$ 580,000
Total Project Cost	$ 13,820,000

Maintenance costs after construction will be nominal for several years, since the proposed transmission line will be new and there will be minimal initial vegetation management required. Typical annual operating and maintenance costs for 115 kV transmission lines across Minnesota Power's Upper Midwest system area are on the order of $400 to $600 per mile of transmission ROW. Operating and maintenance costs for the proposed 230 kV HVTL on steel monopole structures are anticipated to be on the order of $200 per year. The principal operating and maintenance costs include inspections of the transmission ROW, which are usually conducted using fixed-wing aircraft and helicopter on a regular basis.

Minnesota Power performs periodic inspections of substations and equipment. The type and frequency of inspection varies depending on the type of equipment. Typical inspection intervals are semi-annual or annual. Maintenance and repair are performed on an as-needed basis, and therefore the cost varies from substation to substation.

4.0 Facility Description and Route Selection Rationale

4.1 Transmission Line Description

The proposed Project involves building a 1.0-mile 115 kV HVTL and a double-circuit 0.3-mile 230 kV HVTL, as well as restructuring and reconducting 0.9 miles of existing 115 kV HVTL. The proposed Project will use a variety of structure types as appropriate to best fulfill the specific Project needs as described in Section 5.1.1. The 1.0-mile 115 kV HVTL will extend south from an existing substation (Great River Energy's Deer River Substation) north of US Hwy 2, parallel to County Road 161. The line will cross US Hwy 2 and terminate near an existing industrial facility substation (owned by Enbridge Inc.) immediately south of US Hwy 2. The 0.3-mile double-circuit HVTL will tap an existing 230 kV HVTL south of US Hwy 2 and extend north across US Hwy 2 to the proposed Substation Location north of US Hwy 2. The 0.9 miles of existing 115 kV HVTL proposed to be restructured and reconductored will extend south from the proposed Substation Location and then turn west and terminate near an existing industrial facility substation (owned by Enbridge Inc.) immediately south of US Hwy 2.

The proposed Project also involves the removal of approximately seven miles of an existing 115 kV transmission line on H-Frame structures that extends east from the Project area and follows along the south side US Hwy 2 to the City of Cohasset. Removal of the existing 115 kV transmission line will consist of de-energizing the line, taking conductors off of the structures, lifting the poles, cutting the poles off and pushing the remaining pole below grade.

4.2 Route Width and Alignment Selection Process

4.2.1 Route Width

The PPSA directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring their electric needs are met and fulfilled in an orderly and timely fashion" (Minn. Stat. § 216E.02, subd. 1). The PPSA also authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may have "a variable width of up to 1.25 miles" within which the ROW for the facilities can be located (Minn. Stat. § 216E.01, subd. 8).

The proposed Route widths and ROW requirements vary for the two proposed new and rebuilt HVTL segments. The proposed rebuild of the existing 115 kV HVTL will occur within the existing 100-foot ROW. The proposed new 115 kV HVTL will require a 100-foot ROW. Due to the unique engineering challenges associated with maintaining appropriate clearances with existing infrastructure in the area (natural gas pipelines, existing 230 kV HVTL, US Hwy 2), the Applicant is requesting a 1,000-foot route width to allow adequate flexibility in developing a final alignment for the line. The proposed 230 kV HVTL will require a 130-foot ROW. The Applicant is requesting a 500-foot route width for the 230 kV HVTL to allow adequate flexibility as the Applicant works with landowners and addresses engineering constraints in

developing a final alignment for the line. Figure 2 shows the Applicant's proposed Routes including current preferred alignments within the proposed Routes.

4.2.2 Route Selection Process

The Applicant developed the proposed Routes with consideration of the statutory and rule criteria set forth in the PPSA and Minn. R., part 7850.4100 as well as to the State of Minnesota's practice of non-proliferation of new infrastructure corridors. The Applicant also solicited input from interested stakeholders and landowners, including local, state, and federal agencies. In addition, the Applicant assessed existing utility and public ROWs to identify opportunities for ROW sharing and constraints for alignment and pole placement. Figure B-1 shows existing electric transmission line infrastructure in the Project area.

Early in the planning process, the Applicant assessed the general area surrounding the proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the proposed Project. A team of siting, ROW, planning, environmental, ecological, and engineering personnel worked together to develop proposed Routes that minimize overall impacts of the proposed Project while still fulfilling the Project purpose of addressing growing industrial load in the Deer River area, completing a circuit in the Project area, and improving electrical service to current customers and expected load growth.

4.3 Alternate Route Segments Considered and Rejected

A route as defined under Minn. Stat. § 216E.01, subd. 8 and Minnesota Rules, part 7850.1000, subpart 16 is the location of a HVTL between two end points. The route may have a variable width of up to 1.25 miles. For this proposed Project, the Applicant is requesting a 1000-foot route width for the 115 kV HVTL and a 500-foot route width for the 230 kV HVTL. The range of potential routes considered by the Applicant for the proposed Project was constrained by a need to connect to existing infrastructure and the small geographic area of the proposed Project. Because of engineering constraints associated with getting proper clearances around existing infrastructure and the width of the requested routes, there was no need for the Applicant to consider routes other than those shown.

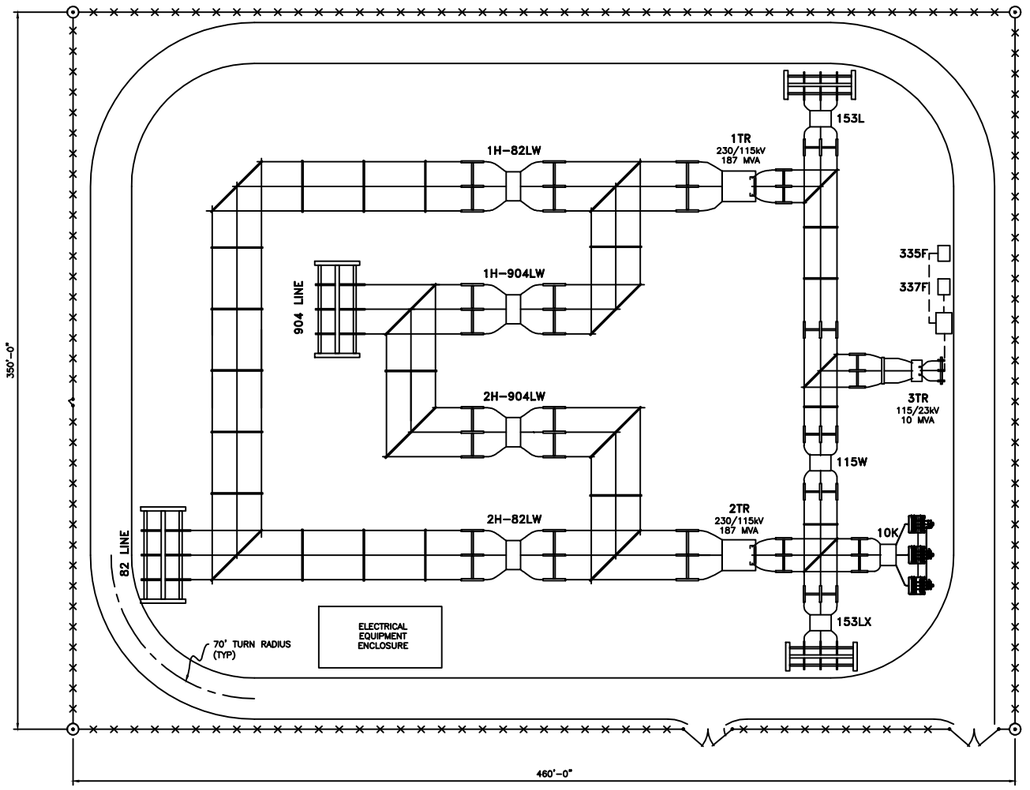
4.4 Associated Facilities and Substation Modifications

The existing Minnesota Power Deer River 115/23 kV substation and associated equipment will be removed and replaced with the new Zemple 230/115/23 kV substation. The new substation will consist of two 230/115 kV transformers and one new 115/23 kV transformer along with associated equipment, control house, circuit breakers surge arrestors and ring bus. The estimated dimensions for the new Zemple substation, subject to final design, are 350 feet by 460 feet. Figure 3 shows the proposed Substation dimensions and preliminary layout.

4.5 Design Options to Accommodate Future Expansion

The proposed facilities are designed with enough capacity to meet current and future needs in the Project area for at least 20 years barring any unforeseen significant load growth.

PROPOSED
ZEMPLE 230/115/23 kV
SUBSTATION



NO.	DATE	REVISION DESCRIPTION	BY	APPROVED
A	8–17–12	INITIAL DRAFT	LAG	.
B	9–4–12	ROTATED SUB 90 DEGREES	LAG	.
C	10–23–12	ROTATED SUB BACK 90 DEGREES, CHANGED 115kV TIE BREAKER TO TIE SW	LAG	.
D	11–13–12	MOVED SUBSTATION WEST AND NORTH	LAG	.
E	3–28–13	ADDED 115kV TIE BREAKER AND 23kV FEEDER RECLOSERS	LAG	.
F	4–2–13	ADDED SWITCH	AJW	.

DRAWN BY	LAG
APPROVED	.
DATE	8–14–12
SCALE	1" = 30'–0"

ZEMPLE 230/115/23kV SUBSTATION
PROPOSED
GENERAL ARRANGEMENT

SHEET 1 | REV. F

ME–30201–04

MICROFILMED / /

CODE . . .

ImageSite: .

.

CADD DRAWING – FOR REPRODUCTION ONLY

5.0 Engineering Design, Construction and ROW Acquisition

5.1 Structures, ROW, Construction and Maintenance

5.1.1 Transmission Structures

The proposed Project will use a variety of structure types as appropriate to address the unique engineering challenges associated with the Project needs. Figure 4 and Figure 5 show typical structure design.

The 230 kV HVTL into the new Zemple substation will be carried on self-supporting steel poles set on foundations. The height and appearance of the proposed steel poles will be similar to the existing 230 kV poles at the proposed tap location, with height and span distance varying as indicated in Table 5.

Due to site specific constraints, reliability, and maintenance concerns, Minnesota Power is evaluating the use of several structure types for the proposed 115 kV HVTL. A steel pole structure will be needed south of US Hwy 2 to allow proper clearances where the line crosses US Hwy 2 and the existing 230 kV HVTL that parallels US Hwy 2. The remainder of the line could be constructed with either wood structures or steel monopole pole structures. The 115 kV HVTL will serve an existing industrial use and other sensitive loads which necessitate a highly reliable line with little opportunity for future planned outages for maintenance. Therefore, Minnesota Power is evaluating the costs and benefits of using higher cost, lower maintenance steel poles versus lower cost, higher maintenance wood poles coupled with line sectionalizing switches to facilitate future maintenance.

Wood poles, where used, will be direct embedded and may require guying particularly at, but not limited to, angle structures. Based on the final alignment of the proposed line, a wood pole line could be constructed with H-Frame direct embedded wood structures as well as monopole tangent and angle structures. H-Frame structures utilize two braced wood poles and suspension insulators. Monopole tangent structures may utilize horizontal posts, braced post insulators, or davit arms with suspension insulators. Monopole angle structures utilize suspension insulators.

Where used, steel poles will be supported on concrete foundations. Steel poles can be designed to be guyed or un-guyed (self-supporting). Steel pole structures for the 115 kV HVTL will generally be monopole structures similar in height and configuration to the wood pole monopoles (post insulator or davit arm).

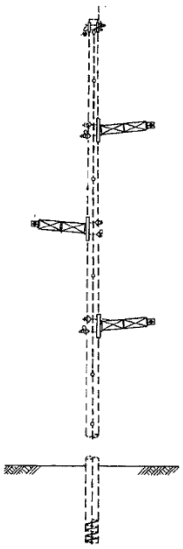
The proposed Project may utilize H-Frame direct embedded wood structures as well as monopole tangent and angle structures. H-Frame structures utilize two braced wood poles and suspension insulators. Monopole structures also utilize wood poles. Monopole tangent structures utilize horizontal post or braced post insulators and monopole angle structures utilize suspension insulators. These monopole structures may be secured with guy wires.

Pole height and span length vary depending on structure type as well as engineering and environmental constraints. Table 5 provides a general summary of typical structure design for each of the structure types used in the proposed Project.

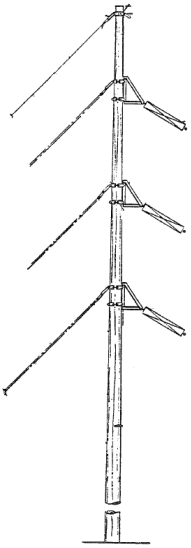
Table 5 Structure Design Summary

Line Type	Structure Type	Structure Material	Typical ROW Width (feet)	Approximate Structure Height (feet)	Structure Base Diameter (inches)	Foundation Diameter (feet)	Span Between Structures (feet)
Single Circuit 115 kV	H-Frame	Wood or Steel	100	Ranges from 55-100ft	Ranges from 16-62"	Wood: direct embed Steel: 6-8ft	600ft +/-100ft
Single Circuit 115 kV	Monopole Angle	Wood or Steel	100	Ranges from 60-110ft	Ranges from 18-72"	Wood: direct embed Steel: 6-8ft	300ft +/-100ft
Single Circuit 115 kV	Monopole Tangent	Wood or Steel	100	Ranges from 60-110ft	Ranges from 18-62"	Wood: direct embed Steel: 4-6ft	300ft +/-100ft
Double Circuit 230 kV	Monopole Angle	Steel	130	Ranges from 100-150ft	Ranges from 66-100"	Steel: 8-10ft	400ft +/-200ft

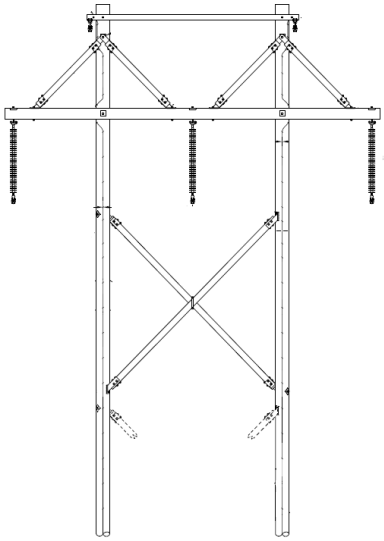
The proposed transmission line will be designed to meet or surpass relevant local and state codes including the National Electric Safety Code (NESC) and Company standards. Appropriate standards will be met for construction and installation, and applicable safety procedures will be followed during and after installation.



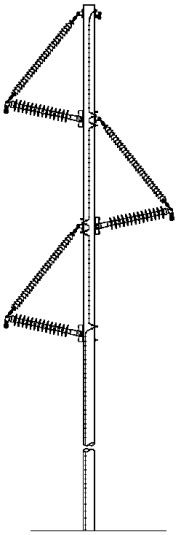
Typical Monopole Tangent Structure (Post Insulator)



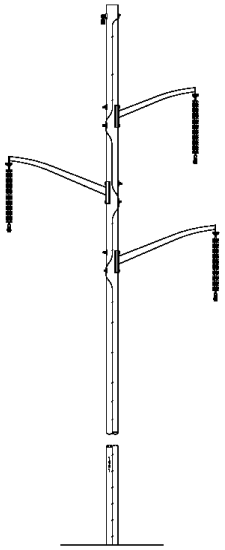
Typical Monopole Angle Structure



Typical H-Frame Structure

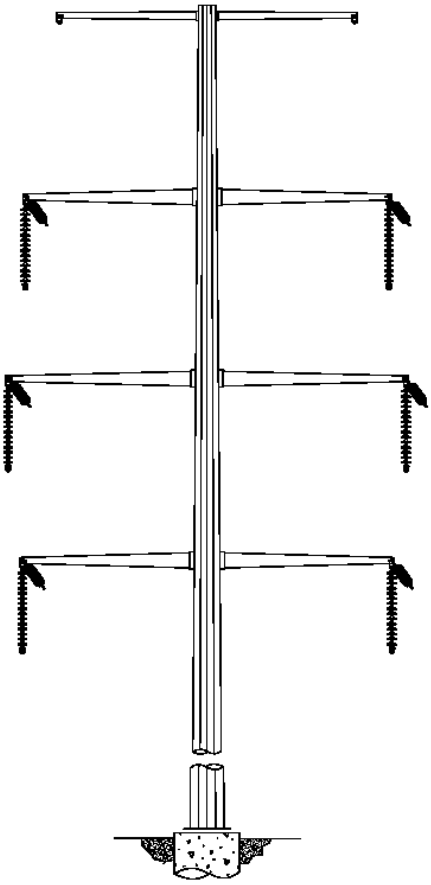


Typical Monopole Tangent Structure (Braced Post)



Typical Monopole Tangent Structure (Davit Arm)

Figure 4 Typical 115 kV Structures



Typical Monopole
Tangent Structure
(Steel)

Figure 5 Typical 230 kV Structures

5.1.2 Right-of-Way Width

The proposed rebuild of the existing 115 kV HVTL will occur within the existing 100-foot ROW. The proposed new 115 kV HVTL will require a 100-foot ROW. The proposed 230 kV HVTL will require a 130-foot ROW. When the transmission line is placed cross-country across private land, an easement for the entire ROW will be acquired from the affected landowner(s). Minnesota Power will locate the poles as close to property division lines as reasonably possible. When the transmission line parallels other existing infrastructure ROW (e.g., roads, railroads, other utilities), an easement of lesser width may be required as parts of the ROW of the existing infrastructure can often be shared with the ROW needed for the transmission line. When paralleling existing ROW, Minnesota Power's typical practice is to place poles on adjacent private property, a few feet away from the existing ROW. With this pole placement, the transmission line shares the existing ROW, thereby reducing the size of the easement required from the private landowner.

5.1.3 Right-of-Way Evaluation and Acquisition

The proposed Project will require approximately 1.3 miles of new ROW for the proposed 115kV transmission line and 230 kV substation exits. The proposed Substation will require an additional 200 feet to the west and an additional 100 feet to the north beyond what had already been acquired for the existing deer river substation, which is being removed.

For transmission lines, utilities typically acquire easement rights across the parcels to accommodate the facilities, including transmission lines and structures. The ROW acquisition process begins early in the detailed design process. The evaluation and acquisition process includes examining titles, contacting owners, surveying, preparing documents and purchasing the ROW. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

The first step in the ROW process is to identify all persons and entities that may have a legal interest in the real estate upon which the facilities will be built. To compile this list, a ROW agent or other persons engaged by Minnesota Power will complete a public records search of all land involved in the proposed Project. A title report is then developed for each parcel to determine the legal description of the property and the owner(s) of record and to gather information about easements, liens, restrictions, encumbrances and other conditions of record.

The next step in the acquisition process is to evaluate the specific parcel. After owners are identified, and typically after a Route Permit is issued for a project, a ROW representative personally contacts each property owner or the property owner's representative. The ROW agent describes the need for the transmission facilities and how the specific project may affect each parcel. The ROW agent also seeks information from the landowner about any specific construction concerns.

The ROW agent may request the owner's permission for survey crews to enter the property and conduct preliminary survey work. The agent may also request permission to take soil borings to assess soil

conditions and determine appropriate foundation design. The soil analysis is performed by an experienced geotechnical testing laboratory. Surveys are conducted to locate the existing ROWs, natural features, man-made features and associated elevations for use during the detailed engineering of the line.

During the evaluation process, the location of the proposed transmission line will be staked. The survey crew identifies the future location of each structure or pole on the ground and places a surveyor's stake to mark the location. The ROW agent shows the landowner exactly where the structure(s) will be located on the property. The ROW agent also delineates the boundaries of the easement area required for safe operation of the transmission line.

Prior to the acquisition of easements of property, land value data will be collected. Based on the impact of the easement or purchase to the market value of each parcel, a fair market value offer will be developed. The ROW agent will contact the property owner to present the offer for the easement and discuss the amount of just compensation to acquire the rights to build, operate, and maintain the transmission facilities within the easement area and for reasonable access to the easement area. The agent will also provide maps of the line route or site and maps showing the landowner's parcel. The landowner is allowed a reasonable amount of time to consider the offer and to present any material that the owner believes is relevant to determining the property's value.

In nearly all cases, utilities are able to work with the landowners to address their concerns, and an agreement is reached for the utility's purchase of land rights. The ROW agent prepares all of the documents required to complete each transaction. Some of the documents that may be required include easement, purchase agreement, or contract and deed.

In rare instances, a negotiated settlement cannot be reached and the landowner chooses to have an independent third party determine the value of the rights taken. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minn. Stat. Chapter 117. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, the ROW agent must obtain at least one appraisal for the property proposed to be acquired and a copy of that appraisal must be provided to the property owner per Minn. Stat. § 117.036, subd. 2(a). The property owner may also obtain another property appraisal and the Company must reimburse the property owner for the cost of the appraisal according to the limits set forth in Minn. Stat. § 117.036, subd. 2(b). The property owner may be reimbursed for reasonable appraisal costs up to $1,500 for single-family and two-family residential properties, $1,500 for property with a value of $10,000 or less, and $5,000 for other types of properties. In the event of a condemnation, the utility will provide the landowner with a copy of each appraisal it has obtained for the land or property rights.

To start the condemnation process, a utility files a Petition in the district court where the property is located and serves that Petition on all owners of the property. If the court approves the Petition, the court then appoints a three-person condemnation "commission." The three people must understand applicable real estate issues. Once appointed, the commissioners schedule a viewing of the substation location or property over and across which the transmission line easement is to be located. Next, the commission schedules a valuation hearing where the utility and landowners can testify as to the fair market value of the easement or fee. The commission then makes an award as to the value of the property acquired and files it with the court. Each party has 40 days from the filing of the award to appeal to the district court for a jury trial. In the event of an appeal, the jury hears land value evidence and renders a verdict. At any point in this process, the case can be dismissed if the parties reach a settlement.

Once ROW is acquired and prior to construction, the ROW agent will again contact the owner of each parcel to discuss the construction schedule and construction requirements. To ensure safe construction of the line, special consideration may be needed for fences, crops, or livestock. For example, fences may need to be moved or temporary or permanent gates may need to be installed; crops may need to be harvested early; and livestock may need to be moved. In each case the ROW agent coordinates these actions with the landowner.

5.1.4 Construction Procedures

Minnesota Power will begin construction after appropriate federal, state, and local approvals are obtained, property and ROWs are acquired, soil conditions are established, and a final design is completed. The precise timing of construction will take into account various requirements that may be in place due to permit conditions, system loading issues, and available workforce.

Minnesota Power's construction process will follow standard construction and mitigation practices, including best management practices (BMPs) that were developed from experience with past projects. These practices address staging, erecting HVTL structures, and stringing HVTLs. Construction and mitigation practices to minimize impacts will be developed by Minnesota Power based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other factors. In some cases, activities or schedules may be modified to minimize impacts on sensitive environmental features.

HVTL structures are generally designed for installation at existing grades. However, some sloped work areas may need to be graded or filled in order to establish a more level work surface for structure installation. If the landowner permits, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities, if any. If permission is not obtained, the site is graded back to its original condition to the extent feasible and imported fill is removed.

Typical construction equipment that may be used for the proposed Project includes tree removal equipment, line construction equipment, stringing equipment, and general construction equipment on

rubber tires or tracks, as appropriate. Staging areas are often established for the proposed Project, which are required for accommodating the equipment and materials necessary to construct the new HVTL facilities. The materials are stored at staging areas until they are needed for the proposed Project.

Minnesota Power may also require staging areas for additional space for storage during construction. These areas have not been identified at this time, but will typically be selected for their location, access, security, and ability to efficiently and safely warehouse supplies. The temporary staging areas outside of the ROW will be obtained by Minnesota Power through rental agreements.

Minnesota Power will access the ROW from existing roads or trails that run parallel or perpendicular to the ROW. In some situations, private field roads or trails may be used. Where necessary to accommodate the heavy equipment used in construction, including cranes, cement trucks, and hole-drilling equipment, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches. To the extent possible, Minnesota Power will coordinate these activities with the affected property owner(s) and/or state and local highway departments as appropriate.

Structure installation first begins by moving structures from the staging areas and delivering them to a staked location. The structures are typically staged within the ROW until the structure is set. Depending on site conditions, structures may be framed in the ground and lifted into place, or the structures may be set first and then bracing and hardware attached.

Most structures will be direct embedded. The area around the structure is then backfilled with crushed rock and/or soil. In lowland areas with poor soil capacity, Minnesota Power will use galvanized steel culverts to increase structure stability.

Angle structures as well as some tangent structures will typically be guyed. Guy wires will be anchored using screw anchors, cross plate anchors, or rock anchors depending on the soil conditions encountered.

After the structures have been assembled, set, and secured, conductors will be installed by establishing stringing setup areas along the route. The conductors will then be pulled with a rope lead that connects to each structure through dollies attached at the insulator locations.

Environmentally sensitive areas (e.g., wetlands) may require special construction techniques, which may vary according to conditions at the time of construction. During construction, impacts on wetland areas will be minimized by Minnesota Power to the extent possible. Additionally, Minnesota Power will use construction practices that help prevent soil erosion and will take measures to ensure that equipment fueling and lubricating will occur at a distance from waterways. Additional mitigative measures relating to wetlands are contained in Section 6.5.2.3.

The Existing Deer River 115/23 kV Substation will be replaced with a new substation that will have two existing 230 kV lines looped into the substation, one from the Boswell Substation near Cohasset, Minnesota, and the other from the Cass Lake Substation near Cass Lake, Minnesota. The 230 kV part of the new substation will consist of a ring bus configuration feeding two 230/115 kV transformers. The 115 kV part of the substation will consist of two 115 kV buses, each fed by one of the 230/115 kV transformers. One 115 kV bus will feed Great River Energy's Deer River Substation and a 115/23 kV Minnesota Power distribution transformer while the other bus will feed Enbridge Pipeline's Deer River Pumping Station and a 115 kV capacitor bank providing additional voltage support to the Deer River area. The 23 kV part of the substation will consist of two 23 kV feeders for local distribution loads.

Construction of the Zemple 230/115/23 kV Substation will be coordinated to minimize the outage time to the Minnesota Power, Great River Energy, and Enbridge substations that currently serve the area. First, the proposed 115 kV line will be built, this connection will enable the existing Minnesota Power Deer River 115/23 kV Substation to be removed to make way for the Zemple Substation. The existing 23 kV distribution loads will be temporary shifted to another substation and reconfigured back when final connections to the new 115/23 kV portion of the Zemple Substation is complete. After the 115/23 kV section of the substation is complete, installation of the 230 kV section of the substation will begin.

It is expected that the new 115/23 kV section of the substation will be completed fourth quarter 2014 and the 230/115 kV portion will be completed second quarter 2015.

5.1.5 Transmission Removal Procedures

The proposed Project includes the removal of approximately seven miles of existing 115 kV HVTL extending from the Project area east along US Hwy 2 to the city of Cohasset. Transmission removal will begin with the removal of conductors. Conductors will be removed by hanging dollies at the insulator locations and using rope leads to pull the conductor from the existing H-Frame structures. The conductor will be wound on reels and salvaged. Next, line hardware will be removed from the structures. Structure removal will consist of lifting the poles, cutting them off, pushing the remaining pole below grade and using fill to bring the pole site up to grade.

5.1.6 Restoration Procedures

Minnesota Power will attempt to limit ground disturbance during construction wherever possible. However, disturbance will occur during the normal course of work, which can take several weeks in any one location. As construction is completed (weather permitting), Minnesota Power will restore disturbed areas to their original condition to the maximum extent practicable. The ROW agents will attempt to contact each property owner after construction is completed to assess if any remaining damage has occurred as a result of the proposed Project. If damage has occurred to crops, fences or the property, Minnesota Power will fairly reimburse the landowner for the damages sustained that are not repaired or restored by Minnesota Power or its representatives. In some cases, Minnesota Power may engage an outside contractor to restore the damaged property as nearly as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of HVTLs will

naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the proposed HVTL route may require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include re-seeding and mulching, erosion control blankets, silt fence installation, and minimizing soil disturbance during construction. To avoid adversely impacting reptile and bird species, Minnesota Power will not use plastic mesh erosion control materials.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction permit plans. These construction techniques typically minimize long-term impacts that may result from the proposed Project.

The Minnesota Noxious Weed Law (Minn. Stat. § 18.75-18.91) defines a noxious weed as an annual, biennial, or perennial plant that the Commissioner of Agriculture designates to be injurious to the public health, the environment, public roads, crops, livestock, or other property. The Minnesota Department of Agriculture's Noxious & Invasive Weed Program assists local governments and landowners with resources for managing noxious and invasive weeds throughout Minnesota. Minnesota Power will attempt to limit the spread of noxious and invasive weeds by cleaning construction equipment before it enters the construction work area and using only invasive-free mulches, topsoil, and seed mixes. Permanent vegetation will be established in areas disturbed within the construction work area except in actively cultivated areas and standing water wetlands. Seed used will be purchased on a "Pure Live Seed" basis for seeding revegetation areas. The seed tags on the seed sacks will also certify that the seed is "Noxious Weed Free."

Minnesota Power may use both herbicides and/or mechanical methods to control the spread of noxious weeds. All herbicides used by Minnesota Power are approved by the Environmental Protection Agency and the State of Minnesota Department of Agriculture. These herbicides are applied by commercial pesticide applicators that are licensed by the Minnesota Department of Agriculture. If during post-construction monitoring of the restored ROW a higher density and cover of noxious weeds on the ROW is noted when compared to adjacent off ROW areas, Minnesota Power will obtain landowner permission and work to mitigate noxious weed concerns.

5.1.7 Maintenance Procedures

Transmission lines and substations are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation.

The estimated service life of the proposed transmission line for accounting purposes is approximately 40 years. However, practically speaking, HVTLs are seldom completely retired. Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail.

Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, which is usually done monthly by air. Annual operating and maintenance costs for transmission lines in Minnesota and surrounding states vary, however, for voltages from 69 kV through 345 kV, past experience shows that costs are approximately $300 to $500 per mile. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The Substation Location must be kept free of vegetation and adequate drainage must be maintained. Minnesota Power personnel are typically on site at least once a week and maintenance needs are noted and scheduled for completion.

5.2 Electric and Magnetic Fields

The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines (referred to as “extremely low frequencies” (ELF)), EMF should be separated into electric fields (EFs) and magnetic fields (MFs), measured in kV per meter (kV/m) and milliGauss (mG), respectively. These fields are dependent on the voltage of a transmission line (EFs) and current carried by a transmission line (MFs). The intensity of the EF is proportional to the voltage of the line, and the intensity of the MF is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (Hz, cycles per second).

5.2.1 Health and Environmental Effects

Considerable research has been conducted in recent decades to determine whether exposure to power-frequency (60 Hz) electric and MFs can cause biological responses and adverse health effects. The multitude of epidemiological and toxicological studies has shown at most a weak association (i.e., no statistically significant association) between EMF exposure and health risks.

In 1999, the National Institute of Environmental Health Sciences (NIEHS) issued its final report on “Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields” in response to the Energy Policy Act of 1992. In the report, the NIEHS concluded that the scientific evidence linking EMF exposures with health risks is weak and that this finding does not warrant aggressive regulatory concern. However, in light of the weak scientific evidence supporting some association between EMF and health

effects and the fact that exposure to electricity is common in the United States, the NIEHS stated that passive regulatory action, such as providing public education on reducing exposures, is warranted.

The United States Environmental Protection Agency (USEPA) seems to have come to a similar conclusion about the link between adverse health effects, specifically childhood leukemia, and power-frequency EMF exposure. On its website, the USEPA states:

> Many people are concerned about potential adverse health effects. Much of the research about power lines and potential health effects is inconclusive. Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related to an increased risk of childhood leukemia, there is still no definitive answer. The general scientific consensus is that, thus far, the evidence available is weak and is not sufficient to establish a definitive cause-effect relationship.

Minnesota, California, and Wisconsin have each conducted their own literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group to evaluate the research and develop policy recommendations to protect the public health from any potential problems arising from EMF effects associated with HVTLs. The Minnesota Department of Health published the Working Group's findings in "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options". The Working Group summarized its findings as follows:

> Research on the health effects of EMF has been carried out since the 1970's. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe.

Based on findings like those of the Working Group and NIEHS, the Commission has consistently found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." This conclusion was further justified in the recent Route Permit proceedings for the Brookings County – Hampton 345 kV Project ("Brookings Project"). In the Brookings Project Route Permit proceedings, the Applicants (Great River Energy and Xcel Energy) and one of the intervening parties both provided expert evidence on the potential impacts of electric and MFs on human health. The administrative law judge (ALJ) in that proceeding evaluated written submissions and a day-and-a-half of testimony from the two expert witnesses. The ALJ concluded: "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EMF] exposure." The Commission adopted this finding on July 15, 2010.

5.2.2 Electric Fields

While there is no official state or federal standard for transmission line EFs, the Environmental Quality Board (EQB) has developed a standard of a maximum EF limit of 8 kV/m measured at one meter above the ground. The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternative current (AC) transmission lines of 500 kV or greater. Table 6 provides the EFs at maximum conductor voltage for the proposed Project. Maximum conductor voltage is defined as the nominal voltage plus ten percent. This is generally an emergency condition, and Minnesota Power typically operates its transmission system between 101 percent and 104 percent of nominal voltage under normal conditions.

Since the maximum EF typically occurs somewhere between but not at 0 and 25 feet from centerline, the maximum EF value for each configuration is not reflected in the table. For the single circuit 115 kV H-Frame type structure, the maximum EF was calculated to be 1.50 kV/m at ±15 feet from the proposed centerline. For the single circuit 115 kV monopole type structure, the maximum EF was calculated to be 1.46 kV/m at 5 feet from the proposed centerline. For the double circuit 230 kV line, the maximum EF was calculated to be 2.66 kV/m at ±20 feet from the proposed centerline. For all configurations, the maximum EF was calculated at one meter above ground.

Table 6 Calculated Electric Fields (kV/m) for Proposed Transmission Line Designs (3.28 feet above ground)

Structure Type	Maximum Operating Voltage (kV)	Distance to Proposed Centerline (feet)												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Single Circuit 115 kV H-Frame	126.5	0.00	0.01	0.07	0.15	0.41	1.28	0.49	1.28	0.41	0.15	0.07	0.01	0.00
Single Circuit 115 kV Monopole	126.5	0.01	0.02	0.07	0.11	0.20	0.42	1.34	0.59	0.20	0.13	0.08	0.02	0.01
Double-circuit 230 kV	253	0.01	0.03	0.06	0.07	0.61	2.47	0.90	2.47	0.61	0.07	0.06	0.03	0.01

5.2.3 Magnetic Fields

There are presently no federal or Minnesota regulations pertaining to MF exposure. The EQB and the Commission have recognized that Florida (a 150 mG limit) and New York (a 200 mG limit) are the only two state standards in the country. Recent studies of the health effects from power frequency fields conclude that the evidence of health risk is weak[1], [2], [3]. The general standard is one of prudent avoidance. The Applicant provides information to the public, interested customers and employees so they have an understanding of the MFs associated with the proposed Project.

The MF profiles around the proposed transmission line for each structure and conductor configuration being considered for the proposed Project are shown in Table 7. MFs were calculated at the conductor's thermal limit based on the design of the HVTL and at the expected peak loading on the lines based on power flow modeling of the transmission system. Since the expected peak loading for each circuit on the double circuit 230 kV line will differ slightly based on how much power is getting off at the new substation, the loading on each circuit is shown in the table. The peak MF values are calculated at a point directly under the HVTL and where the conductor is closest to the ground. The same method is used to calculate the MF at the edge of the ROW. MF profile data show that MF levels generally decrease rapidly as the distance from the centerline increases.

Due to the conductor configuration of the single circuit 115 kV monopole type structure, the peak MF for this configuration actually occurs at approximately 5 feet from the centerline of the transmission line, and is not given in Table 7. This peak MF was calculated to be 114.94 mG under the conductor thermal limit condition and 58.96 mG under the expected peak loading condition. Similarly for the double circuit 230 kV line, the peak MF for the expected peak loading condition does not occur at the centerline because one of the circuits carries more current than the other. This peak MF was calculated to be 101.67 mG at -10 feet from centerline. For the double circuit 230 kV line at conductor thermal limit and for the 115 kV H-Frame under all conditions, the peak MF will occur at the centerline of the proposed transmission line, and is given in Table 7 at 0 feet.

Because the actual power flow on a transmission line could potentially vary widely throughout the day depending on electric demand, the actual MF level could also vary widely from hour to hour. In any case, the typical loading of the transmission line will be far below the thermal limit of the line and should remain at or below the expected peak loading for the foreseeable future, resulting in typical MFs well below those indicated in Table 7.

Table 7 Calculated Magnetic Fields (mG) for Proposed 115 kV Transmission Line

Structure Type	Current (Amps)	Distance to Proposed Centerline (feet)												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Magnetic Field Profile at Conductor Thermal Limits														
Single Circuit 115 kV H-Frame	915	1.27	2.84	11.10	19.28	40.43	111.36	207.81	111.36	40.43	19.28	11.10	2.84	1.27
Single Circuit 115 kV Monopole	915	0.89	1.96	7.12	11.71	22.20	51.98	113.57	67.66	28.10	14.08	8.24	2.12	0.94
Double-circuit 230 kV	1609.1	0.72	2.34	15.87	32.28	76.02	187.49	256.66	187.49	76.02	32.28	15.87	2.34	0.72
Magnetic Field Profile at Expected Peak Loading														
Single Circuit 115 kV H-Frame	469.4	0.65	1.46	5.70	9.89	20.74	57.13	106.61	57.13	20.74	9.89	5.70	1.46	0.65
Single Circuit 115 kV Monopole	469.4	0.46	1.00	3.65	6.01	11.39	26.67	58.26	34.71	14.41	7.22	4.23	1.09	0.48
Double-circuit 230 kV	713 515	0.67	1.76	9.14	17.20	37.23	83.19	98.88	61.53	21.67	7.93	3.30	0.30	0.13

5.2.4 Stray Voltage

Stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings, such as barns and milking parlors, and can occur on the electric service entrances to structures from distribution lines, not HVTLs. HVTLs do not, by themselves, create stray voltage because they do not connect to businesses or residences. HVTLs, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the HVTL. Appropriate measures will be taken to prevent stray voltage problems when the proposed HVTL parallels or crosses distribution lines.

5.2.5 Farm Operations, Vehicle Use and Metal Buildings Near Power Line

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. Potential shocks can be prevented by using a couple of methods including:

- one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected; or
- an electric filter can be instilled that grounds out charges induced from a power line while still allowing the charger to be effective.

Farm equipment, passenger vehicles, and trucks may be safely used under and near power lines. The power lines will be designed to meet or exceed minimum clearance requirements over roads, driveways, cultivated fields, and grazing lands specified by the NESC. Recommended clearances within the NESC are designed to accommodate a relative vehicle height of 14 feet.

There is a potential for vehicles under HVTLs to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap to the vehicle long enough to touch the earth. Such buildup is a rare event because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the ROW itself because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the ROW could damage a transmission line. As a result, NESC guidelines establish clear zones for transmission facilities. Metal buildings may have unique issues. For example, metal buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure can contact the Applicant for further information about proper grounding requirements.

If a customer suspects that stray voltage/neutral to earth voltage (NEV) is a concern on their property, they can call the Minnesota Power stray voltage hotline 1-800-228-4966 ext. 5031. The customer can contact a Minnesota Power technician or engineer and discuss the situation. If an on-farm investigation is warranted it will be scheduled. On the day of the investigation, the Minnesota Power team will arrive and conduct an investigation of the utility system serving the farm and the farm wiring. The team will discuss the preliminary results with the customer before leaving the farm. In most instances, recording volt meters will be set to measure activity over several days. A few days later these will be retrieved by Minnesota Power for analysis. Upon completing the analysis, a Minnesota Power engineer or technician will call the customer to discuss the results.

6.0 Environmental Information

This section analyzes potential resource impacts associated with the proposed Project. This section provides a description of the environmental setting, potential impacts, and mitigative measures the Applicant proposes, where appropriate, to minimize the impacts of siting, constructing, and operating the proposed Project. If the proposed transmission line and the substation were removed in the future, the land could be restored to its prior condition and/or redirected to a different use. The majority of the measures proposed are part of the standard construction process for the Applicant. Unless otherwise identified in the following text, the costs of the mitigative measures proposed are considered nominal.

6.1 Environmental Setting

The proposed Project is located just east of the City of Deer River, Minnesota in west-central Itasca County. The proposed Project is located near existing industrial land use, a commercial development and some residential land.

The Project area is located within the Northern Minnesota Drift and Lake Plains Section, a section within the biogeographic province known as the Laurentian Mixed Forest Province under the Ecological Classification System (ECS) developed by the Minnesota Department of Natural Resources (MnDNR)[4]. The Project area located in the Chippewa Plains Subsection of the Northern Minnesota Drift and Lake Plains Section, near the transition between the Chippewa Plains and St. Louis Moraines Subsections[4]. The Chippewa Plains Subsection is characterized by level to gently rolling lake plains and till plains. Three large, heavily used lakes are located within this subsection including Leech Lake, Lake Winnibigoshish, and Cass Lake. Conifers dominated the sandier portions of the subsection before settlement. Aspen-birch, sugar maple, basswood, northern red oak, and bur oak were common components on more productive soils. Much of this subsection is presently forested and forestry is one of the most important land uses. Aspen is the most common tree species and is found in pure stands and mixed stands along with birch, maple, oak, white spruce, jack pine, and red pine. Tourism and recreation associated with lake and outdoor activities are also important in the region. Agriculture is also an important local land use, but is primarily prevalent in the western part of the subsection.

6.2 Human Settlement

6.2.1 Public Health and Safety

Minnesota Power will implement proper safeguards during construction and operation to avoid potential impacts public health and safety. Concerns related to health and safety includes hazards associated with coming into contact with energized equipment, induction, stray voltage, and potential impacts to implantable medical devices. In general, impacts to public health and safety from the project are not anticipated.

6.2.1.1 Mitigative Measures

The proposed Project will be designed in compliance with local, state, NESC, and Minnesota Power standards for clearance to ground, crossing utilities and buildings, strength of materials, and ROW widths. Minnesota Power will ensure that construction and contract crews comply with local, state, NESC, and Company standards for installation of facilities and standard construction practices. Minnesota Power and industry safety procedures will also be followed after the proposed Project is installed. This will include clear signage during all construction activities.

The proposed HVTL will be equipped with protective devices (circuit breakers and relays located in the substation where the transmission lines terminate) to safeguard the public if an accident occurs, such as a structure or conductor falling to the ground. The protective equipment will de-energize the transmission line should such an event occur. Minnesota Power will post signage to warn the public about the risk of coming into contact with the energized equipment. The proposed Substation will be fenced and signed as well. With implementation of safeguards and protective measures, the proposed Project is not anticipated to result in adverse or significant impacts on public health and safety.

6.2.2 Residential and Non-Residential Land Use

The proposed Routes will cross areas zoned by Itasca County as “industrial”, “light industrial”, and “farm residential.”[5] The 115 kV portion of the proposed Project north of US Hwy 2 is located primarily adjacent to forested wetland and open field areas. Adjacent land use along the northern portion of the 115 kV route also includes a small business located just east of County Road 161. South of US Hwy 2, an existing pipeline terminal is located on the east side of the proposed 115 kV route and a small business and one residence are located along the west side of the proposed Route. The 230 kV route primarily crosses open field areas and is located adjacent to existing electrical transmission line infrastructure. The proposed 115 kV rebuild primarily crosses open fields and would replace an existing HVTL. The proposed Zemple substation will be built on an existing substation site owned by Minnesota Power (the Deer River Substation) and is located adjacent to open field areas. It is anticipated that an additional 200 X 450 feet on the west side of the proposed Substation and an additional 100 X 600 feet on the north side of the proposed Substation will need to be acquired to accommodate the substation rebuild (a total of approximately 3.5 acres). Table 8 summarizes the number of residences located within the Proposed ROWs, Routes and within 200 feet of these routes.

Table 8 Residential and Non-residential Buildings within Various Distances of Proposed Route

Structure Type	Proposed Route	Number of Structures within Various Distances		
		Within ROW	Within Route	Within 200 foot buffer of Route
Residence	115 kV Route	0	0	0
	230 kV Route	0	0	0
	115 kV Rebuild	0	NA	NA
Commercial Structure	115 kV Route	1	18	24
	230 kV Route	0	0	0
	115 kV Rebuild	0	NA	NA

"NA" refers to not applicable because the 115 kV rebuild does not have a route associated with it.

The proposed Project will not require displacement of occupied residences or commercial businesses. Minnesota Power will seek to construct the HVTL consistent with any applicable zoning ordinances. However, no zoning, building, or land use approvals will be required from surrounding municipalities if a Route Permit is issued for the proposed Project because once the Commission issues a Route Permit, zoning, building, and land use regulations and rules are preempted per Minn. Stat. § 216E.10, subd. 1. No adverse or significant impacts on residential or commercial structures as a result of the proposed Project are anticipated.

6.2.2.1 Mitigative Measures

As discussed in section 4.2.2 as part of the planning process, the Applicant assessed the general area surrounding the proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the proposed Project. A team of siting, ROW, planning, environmental, ecological, and engineering personnel worked together to develop proposed Routes that minimize overall impacts of the proposed Project. Based on this work the proposed Project has been designed to avoid displacement of homes. Because no displacement will occur, no additional mitigative measures are proposed.

6.2.3 Noise

Transmission conductors produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal.

Noise emissions from a transmission line occur during certain weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound when a small amount of electricity ionizes the moist air near the wires. During heavy rain, the background noise level of the rain is usually greater than

the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines can produce noise. Noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually audible. At substations, the source of noise is primarily the transformers, which can create a humming noise.

Since human hearing is not equally sensitive to all frequencies of sound, the most noticeable frequencies of sound are given more "weight" in most measurement schemes. The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in decibels (dBA). A noise level change of 3 dBA is barely perceptible to human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness, while a 20 dBA change is considered a dramatic change in loudness. Table 9 shows noise levels associated with common, everyday sources.

Table 9 Common Noise Sources and Levels

Noise Source*	Sound Pressure Level (dBA)
Jet Engine (at 25 meters)	140
Jet Aircraft (at 100 meters)	130
Rock Concert	120
Pneumatic Chipper	110
Jackhammer (at 1 meter)	100
Chainsaw. Lawn Mower (at 1 meter)	90
Heavy Truck Traffic	80
Business Office, Vacuum Cleaner	70
Conversational Speech, Typical TV Volume	60
Library	50
Bedroom	40
Secluded Woods	30
Whisper	10

Source: Minnesota Pollution Control Agency[6].

In Minnesota, statistical sound levels ("L" or Level Descriptors) are used to evaluate noise levels and identify noise impacts. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} may be exceeded 10 percent of the time within an hour.

Land areas, such as picnic areas, churches, or commercial spaces, are assigned to an activity category based on the type of activities or use occurring in the area. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories. Residential areas,

churches, and similar type land use activities are included in NAC 1; commercial-type land use activities are included in NAC 2; and industrial-type land use activities are included in NAC 3.

Table 10 identifies the established daytime and nighttime noise standards by NAC.

Table 10 Noise Standards by Noise Area Classification (dBA)

NAC	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

The audible noise associated with the proposed transmission line was modeled using the Corona and Field Effects (CFE) spreadsheets developed by the Bonneville Power Administration. Table 11 presents the L_5 and L_{50} noise levels predicted for proposed transmission line structures and voltages for the proposed Project. The worst case indicated that the audible L_5 and L_{50} noise levels measured at the edge of the ROW (35 feet from centerline) are associated with the 230 kV line and will be 54.97 and 51.47 dBA, respectively, well below the MPCA limits for the relevant noise area classifications (NAC 2 and NAC 3) in the area crossed by the line.

Table 11 Calculated Audible Noise (dBA) for Proposed Transmission Line Designs

Structure Type	Noise L_5 (Edge of ROW) (Decibels a weighted)	Noise L_{50} (Edge of ROW) (Decibels a weighted)
115 kV H-Frame	22.55	19.05
115 kV Single Pole	22.36	18.86
230 kV Double-circuit	54.97	51.47

The noise generated from the proposed HVTLs is not expected to exceed background noise levels and will, therefore, not be audible at any receptor location. The proposed HVTLs will be designed and constructed to comply with state noise standards established by the MPCA. Any audible noise will be below the MPCA noise standards established for NAC 1. Additionally, it is not anticipated that the proposed Project will increase noise from transmission line conductors or any associated facilities above the levels already experienced in the area.

Transformer “hum” is the dominant noise source at substations. Transformer hum is caused by magnetostrictive forces within the core of the transformer. These magnetic forces cause the core laminations to expand and contract, creating vibration and sound at a frequency of 100 Hz (twice the a.c. mains frequency), and at multiples of 100Hz (harmonics). Typically, the noise level does not vary with transformer load, as the core is magnetically saturated and cannot produce any more noise.

Given the distance of over 1000 feet from the proposed Substation Location to the nearest home, it would be very unlikely that substation noise would be audible to residents. The proposed Substation will be designed and constructed to comply with state noise standards established by the MPCA.

With implementation of state design and construction standards, the proposed Project is not anticipated to result in adverse or significant impacts on the public as a result of noise.

6.2.3.1 Mitigative Measures

As discussed in section 4.2.2 as part of the planning process, the Applicant assessed the general area surrounding the proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the proposed Project. A team of siting, ROW, planning, environmental, ecological, and engineering personnel worked together to develop proposed Routes that minimize overall impacts of the proposed Project. Based on this work the proposed Project has been designed to avoid proximity to homes and no additional mitigative measures are proposed.

6.2.4 Television and Radio Interference

Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate modification of (or addition to) the receiving antenna system. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the ROW to either side.

FM radio receivers usually do not pick up interference from transmission lines because:

- corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz); and
- the excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances

A two-way mobile radio located immediately adjacent to and/or behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This will generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also

cause television interference. If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, the Applicant will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the present level, including the appropriate modification of receiving antenna systems if deemed necessary.

6.2.4.1 Mitigative Measures

The Applicant does not anticipate that the proposed Project would create interference with radio or television signals, however if radio or television interference occurs due to the proposed Project, the Applicant will work with the affected landowner to restore reception to pre-Project quality.

6.2.5 Aesthetics

Aesthetics refer to the natural and human modified landscape features or visual resources that contribute to the public's experience and appreciation of the environment. Wetlands, surface waters, landforms, forests, and vegetation patterns are among the natural landscape features that define an area's visual character. Buildings, roads, bridges, and other structures reflect human modifications to the landscape. The scenic value or visual importance of an area is a subjective matter and depends upon the perception and philosophical and/or psychological response of the viewer. Generally, landscapes that exhibit a high degree of variety and harmony among the basic elements of form, line, color, and texture have the greatest potential for high visual and aesthetic quality. The level of impact to visual resources is also subjective and generally depends on the sensitivity and exposure of a particular viewer and can, therefore, vary greatly from one individual to the next.

The proposed Project will be constructed primarily adjacent to existing road ROW and existing transmission line and industrial infrastructure. Therefore, the proposed Project is not expected to change the nature of the existing viewshed in the Project area. As discussed in Section 5.1.1, the proposed Project will utilize a variety of structure types as appropriate to best fulfill the specific Project needs. Wood poles, where used, will be direct embedded and may require guying particularly at but not limited to angle structures. Based on the final alignment of the proposed line, a wood pole line could be constructed with H-Frame direct embedded wood structures as well as monopole tangent and angle structures. H-Frame structures utilize two braced wood poles and suspension insulators. Monopole tangent structures may utilize horizontal posts, braced post insulators, or davit arms with suspension insulators. Monopole angle structures utilize suspension insulators. Where used, steel poles will be supported on concrete foundations. Steel poles can be designed to be guyed or un-guyed (self-supporting). Steel pole structures for the 115 kV HVTL will generally be monopole structures similar in height and configuration to the wood pole monopoles (post insulator or davit arm). Pole height and span length vary depending on structure type as well as engineering and environmental constraints.

These proposed transmission line structures will be visible to drivers traveling along US Hwy 2 and will be visible to residents in the few residences located near the proposed Routes. However, given the

existing infrastructure in the immediate vicinity, the proposed Project is not expected to appreciably alter the visual experience of travelers and residents in the area.

6.2.5.1 Mitigative Measures

The proposed Route alternatives maximize ROW sharing with existing linear corridors (transmission lines and roadways) to minimize the proliferation of visual impacts to open spaces. The route alternatives were designed to avoid developed areas and areas with high quality, distinctive view sheds, including scenic highways, river crossings, and similar areas. During the construction uniform structure types to the extent practical will be used. The height of the structure may be reduced (including using the shorter H-frame structures) to minimize impacts within scenic areas.

6.2.6 Socioeconomic

Population and economic characteristics based on the 2010 U.S. Census are provided in Table 12. As reported in the 2010 U.S. Census, the population density of Itasca County is 16.9 people per square mile. Minorities and persons living in poverty make up 5.5 percent and 11.4 percent of the population, respectively. For comparison, minorities comprise 15.9 percent of the statewide population and 11 percent of Minnesota residents live in poverty[7].

The minority population percentage and per capita income in Cohasset is similar to the county as a whole. However, Deer River is home to a slightly larger minority population with a lower per capita income and higher poverty rate. No impacts are anticipated to minority or low-income populations.

Table 12 Population and Economic Characteristics

Location	Population	Minority Population (percent)	Caucasian Population (percent)	Per Capita Income	Percentage of Population Below Poverty Level
Cohasset[a]	1,707	5.1	94.9	21,071	5.6
Deer River[b]	930	16.2	83.8	13,078	17.3
Itasca County[b]	5,303,925	5.5*	93.7	24,067	11.4

*Sum of Black persons, American Indian and Alaska Native persons, Asian persons, Native Hawaiian and Other Pacific Islander persons and Persons of Hispanic or Latino Origin percentages.
a.[7]
b.[8], [9]

Approximately 24 to 30 workers will be required for transmission line construction and 20 to 30 workers will be needed, on average, for the substation construction.

There will be minor short-term impacts to community services as a result of construction activity and an influx of contractor employees during construction of the proposed Project. Utility personnel or contractors will be used for all construction activities. The communities near the Project area may experience a minor short-term positive economic impact through the use of the hotels, restaurants, and other services by the various workers.

It is not expected that additional permanent jobs will be created by any of these actions. The construction activities will provide a seasonal influx of additional dollars into the communities during the construction phase, and materials such as concrete may be purchased from local vendors where feasible. Long-term beneficial impacts from the proposed transmission lines and substation expansion include increased local tax base resulting from the incremental increase in revenues from utility property taxes.

6.2.6.1 Mitigative Measures

Socioeconomic impacts resulting from the proposed Project will be primarily positive with an influx of wages and expenditures made at local businesses during project construction, and increased tax revenue once the proposed Project is operational. No mitigative measures are proposed.

6.2.7 Cultural Values

Cultural values include those perceived community beliefs or attitudes that provide a framework for unity in a given community. The communities near the proposed Project appear to value outdoor recreation and the scenic nature of the northwoods region. The communities in the Project area have cultural ties to German, Norwegian, Swedish, Irish, English, French, and Native American heritages.[10] Deer River is host to two large community festivals each summer, the World's Largest Wild Rice Festival and the Bar-b-que & Brew Festival. The nearby White Oak Learning Center celebrates centuries of Native American heritage as well as the Fur Trade era. Deer River is also home to one of the Leech Lake Band of Ojibwe's three Minnesota casinos. The proposed project is not expected to impact the framework or sense of unity of the community and will not alter features in the area that contribute significantly to the cultural nature of the region.

6.2.7.1 Mitigative Measures

No impacts are anticipated and, therefore, no mitigative measures are proposed.

6.2.8 Recreation

The Project area is located in a region that is known for its outdoor recreation opportunities. The region includes vast areas of forest, lakes, rivers, and streams, making it a destination for outdoor recreation. The area offers opportunities for walleye and northern pike fishing, kayaking, boating, cycling, hiking, hunting, cross country skiing, and snowmobiling. Deer River is known as the "Gateway to Chippewa National Forest". The forest covers 666,623 acres, with over 1,300 lakes, 923 miles (1,485 km) of rivers and streams, and 400,000 acres of wetlands.

The proposed Project is not located in the immediate vicinity of any recognized recreational area. Direct impacts to existing recreational opportunities are not expect to occur as the proposed Route is located in an area that is adjacent to a major roadway as well as existing industrial and electrical infrastructure.

6.2.8.1 Mitigative Measures

No impacts are anticipated and, therefore, no mitigative measures are proposed.

6.2.9 Public Services

Public services and facilities in the proposed Project area generally include emergency services provided by government entities, including hospitals, fire departments, and police departments, water supply or wastewater disposal systems, and gas and electricity services, and existing and future transportation corridors and projects.

6.2.9.1 Emergency Services

Any required temporary lane closures on US Hwy 2 or County Road 161 will be coordinated with the local jurisdictions, and will provide for safe access of police, fire, and other rescue vehicles.

6.2.10 Utilities

Construction and operation of the proposed Project is not anticipated to impact any public service utilities. The Deer River area is currently served by a single 7.5 mile long 115 kV line. This tap has multiple load-serving taps on it. Because all the power required to serve these customers must flow on the Deer River Tap, the line experiences high power flows under certain system conditions. Because of its age and condition, MP has reason to believe that this line may be approaching or exceeding its thermal capacity at times. Anticipated expansion at the large industrial facility will further load the line, exacerbating this issue. Due to the radial arrangement of the Deer River Tap and the outage restrictions associated with this industrial facility, performing maintenance or upgrades on the line is very difficult and generally must be done while the line is energized. As an alternative to rebuilding the Deer River Tap, the proposed Deer River Project provides significantly improved reliability, constructability and long-term load-serving capability. The proposed Project will also enhance MP's ability to operate and maintain the transmission system in the Deer River area for the foreseeable future.

6.2.11 Transportation and Traffic

Transportation infrastructure in the proposed Project area includes roads, railroads, and one municipal airport in Deer River. The proposed Route runs parallel to and crosses roads, including County Road 161 and US Hwy 2. Roadways can potentially be impacted temporarily during construction activities and during maintenance of the transmission line. Impacts could result from construction vehicles and safety perimeters temporarily blocking public access to streets and businesses. Access during construction and maintenance is expected to be primarily from existing roads. Due to the temporary nature of the proposed construction activities, traffic disruptions are expected to be minor and temporary. Structure placement along roadways can also impact future road expansions, as structures placed within the ROW must be moved to allow a safe distance between structures and the edge of the roadway. Comments were requested regarding the proposed Project from both Itasca County and the Minnesota Department of Transportation (MnDOT) (Appendix D). To date, no response has been received.

The closest airport to the proposed Project area is the Deer River Municipal Airport, which is located approximately 2 miles away north of the City of Deer River. Tall HVTLs can conflict with the safe operation of public and private airports and air strips. The Federal Aviation Administration (FAA) and MnDOT have each established development guidelines on the proximity of tall structures to public use airports. The FAA has also developed guidelines for the proximity of structures to Very-High-Frequency Omni-Directional Range (VOR) navigation systems. Due to the distance between the Deer River Municipal Airport and the proposed Project, construction and operation of the line and substation are not anticipated to impact safe operation and use of the airport.

6.2.11.1 Mitigative Measures

No impacts to emergency services are anticipated, Minnesota Power will minimize potential impacts through coordination of the construction with local and state road authorities and use signage during construction to alert drivers. No significant conflicts are anticipated.

Operation of the transmission line is not expected to impact traffic along these roadways and pole placement and construction procedures will be developed in consultation with state and county roadway authorities to meet requirements for clear zones and roadside obstructions. Planning for the proposed Project will also be coordinated with MnDOT and Itasca County transportation policies to minimize impacts from construction of the proposed Project.

6.3 Land Based Economics

6.3.1 Agriculture

Federal regulations define prime farmland as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.” (7 C.F.R. 657.5(a)(1)). Table 13 identifies the types and acreages of farmland within the proposed Routes and proposed Substation Location.

Areas identified as prime farmland and as prime farmland if drained (soils that have the potential to be prime farmland but will require hydrologic alteration) occur within the 115 kV HVTL route; representing approximately 57 percent of the ROW and 64 percent of the route. However, at present, much of the 115 kV route consists of industrial/commercial land and wetlands. No active agricultural lands are located within the preliminary centerline ROW.

Within the 230 kV HVTL route, prime farmland and prime farmland, if drained, represent approximately 54 percent of the ROW and 55 percent of the route. Minnesota Power proposes to use monopole steel structures for the transmission line structures and the easement area will still be able to be farmed by the land owner. The amount of agricultural land removed from production will be minimal.

Within the 115 kV HVTL rebuild, prime farmland and prime farmland, if drained, represent approximately 70 percent of the ROW. However, because there is an existing HVTL already present in the ROW, impacts to prime farmland are not anticipated.

The entire proposed Zemple Substation Location is mapped as prime farmland if drained. The proposed Minnesota Power Zemple Substation will replace the existing Minnesota Power Deer River Substation at the same location. An additional 200 x 450 foot area on the west side of the existing substation and an additional 100 x 600 foot area on the north side of the existing substation will need to be acquired to accommodate the new substation expansion. In total, an additional 3.5 acres will be removed from agricultural production to accommodate the proposed Substation.

Construction activities could result in impacts to agricultural lands, including soil erosion, interference with and damage to agricultural surface and subsurface drainage and irrigation systems, mixing or loss of topsoil and subsoil, and soil compaction however, those impacts are expected to be minimal.

Table 13 Prime Farmland within ROW and Routes and Proposed Substation Location

Project Area	Prime Farmland (Acres)		Prime Farmland if Drained (Acres)	
	ROW	Route	ROW	Route
115 kV Route	1.0	15.4	3.9	48.7
230 kV Route	0.2	2.5	1.2	4.5
115 kV Rebuild	2.3	NA	5.0	NA
Proposed Substation Location	NA	0	NA	8.2

6.3.1.1 Mitigative Measures

Landowners will be compensated for the use of their land through easement payments. Additionally, the Applicant intends to minimize loss of farmland and rural properties and to ensure reasonable access to the land near the structures by overlapping with existing ROW and using mono pole structures where possible.

Permanent impacts to cropland will occur where transmission line structures, such as poles, are placed on cropland. In areas where cropland is crossed, temporary impacts such as soil compaction and crop damages within the ROW may occur. When possible the Applicant will construct the HVTLs and remove existing HVTLs before crops are planted or following harvest; attempts will be made to avoid spring time construction. However, if construction during spring time is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route. This may require construction of temporary driveways between the roadway and the structure, but will limit traffic on fields between structures. Construction mats may also be used to minimize impacts on the access paths and in construction areas. The Applicant's construction team will work with the property owner, ROW agent, and engineers to minimize the impact on property through use of the landowner's knowledge of the property. In addition to payments for easements acquired, the Applicant will compensate landowners for any crop damage and soil compaction that occurs as a result of the proposed Project.

6.3.2 Forestry

There are no known tree farms or federal or state forests located within the proposed Routes or proposed Substation Location. However, the Chippewa National Forest is located approximately one-quarter mile southwest of the proposed 115 kV route and over one-half mile from the proposed 230 kV route and proposed Substation Location (Figure B-1).

6.3.2.1 Mitigative Measures

No impacts to forestry resources are anticipated and, therefore, no mitigative measures are proposed.

6.3.3 Tourism

No tourist areas are present within the proposed Routes or proposed Substation Location area. However, nearby lakes, rivers, parks, and forests, such as the Chippewa National Forest, provide a variety of outdoor recreational activities for tourists visiting the area (Figure B-1).

6.3.3.1 Mitigative Measures

No impacts to tourism resources are anticipated and, therefore, no mitigative measures are proposed.

6.3.4 Mining

There are no gravel pits, rock quarries, commercial aggregate sources, or any other mining resources located within the proposed Routes or proposed Substation Location.

6.3.4.1 Mitigative Measures

No impacts to mining resources are anticipated and, therefore, no mitigative measures are proposed.

6.4 Archaeological and Historic Resources

Archaeological and historic resources are those places that represent the visible or otherwise tangible record of human occupation. These resources vary in size, shape, condition, and importance, among other considerations; some are evident on the landscape, while others are buried or only visible to knowledgeable people.

In December 2012, Barr Engineering Company (Barr), on behalf of the Applicants, requested and received from the State Historic Preservation Office (SHPO), a summary of documented archaeological and historic resources within the vicinity of the Project area. Based on the data from SHPO, no archaeological or historic resources have been documented within the proposed Routes or proposed Substation Location area. However, the SHPO data did identify four archaeological resources and seven historic resources within one mile of the proposed 115 kV route; one archaeological resource and one historic resource within one mile of the proposed 230 kV route; three archaeological resources and one historic resources within one mile of the proposed 115 kV rebuild; and one archaeological resource and one historic resource within one mile of the proposed Substation Location (Table 14 and Figure B-1).

On December 7, 2012 the Applicant mailed a letter to SHPO notifying the agency of the proposed Project and public meeting. On December 24, 2012, the Applicant received a letter from SHPO stating the following: "Based on our review of the project information, we conclude that there are no properties listed in the National Register or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project." (Appendix D).

Table 14 Identified Archaeological and Historic Resources within 1 Mile of the Proposed Project

Type	Site Inventory Number	Site Name/Type	Within 1 Mile of Proposed Project Area(s)
Archaeological	21IC0109	Deer River Metering Station	115 kV HVTL
Archaeological	21IC0272	Unknown	115 kV HVTL
Archaeological	21ICy	Unknown	115 kV HVTL, 230 kV HVTL, and Substation Location
Archaeological	21Cib	Todd and Fayles Camp	115 kV HVTL
Historic	IC-DRC-001	Itasca Lumber Company Superintendent's Residence	115 kV HVTL
Historic	IC-DRC-002	"Beehive Row" Worker's Housing District	115 kV HVTL
Historic	IC-DRC-003	1930's Lumber Dry Kiln	115 kV HVTL
Historic	IC-DRC-013	First National Bank	115 kV HVTL
Historic	IC-DRC-014	Farmer's State Bank	115 kV HVTL
Historic	IC-DRT-005	Farmstead	115 kV HVTL, 230 kV HVTL, and Substation Location
Historic	IC-ZMC-001	Old Zemple Town Hall	115 kV HVTL

6.4.1.1 Mitigative Measures

The proposed Project will avoid impacts to identified archaeological and historic resources within the vicinity; therefore no mitigative measures are proposed.

6.5 Natural Environment

6.5.1 Air Quality

Potential air quality effects related to transmission facilities include fugitive dust emissions during construction, exhaust emissions from construction equipment, and ozone generation during transmission line operation. All of these potential effects are considered to be relatively minor, and all but the ozone effects are short-term.

State and federal governments currently regulate permissible concentrations of ozone and nitrogen oxides. Ozone forms in the atmosphere when nitrogen oxides and volatile organic compounds react in the presence of heat and sunlight. Air pollution from cars, trucks, power plants, and solvents contribute

to the concentration of ground-level ozone through these reactions. Currently, both state and federal governments regulate permissible concentrations of ozone and nitrogen oxides. The national standard is 0.075 parts per million (ppm) during an 8-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in 1 year.

The only potential air emissions from a transmission line result from corona, and such emissions are limited. Corona consists of the breakdown or ionization of air within a few centimeters immediately surrounding conductors and can produce ozone and oxides of nitrogen in the air surrounding the conductor. This process is limited because the conductor electrical gradient of a 115 kV transmission line is usually less than that necessary for the air to break down. Typically, some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona.

Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived. There are currently no non-attainment areas listed for Itasca County.[11]

During construction of the proposed HVTLs, minor emissions from vehicles and other construction equipment and fugitive dust from right-of-way clearing will occur, but will be limited. Air-quality impacts during the construction phase will also be temporary. The magnitude of construction emissions is heavily influenced by weather conditions and the specific construction activity. Exhaust emissions, primarily from diesel equipment, will vary according to the phase of construction, but will be minimal and temporary. Adverse impacts on the surrounding environment will be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

The proposed Project is not anticipated to result in adverse or significant effects on air quality.

6.5.1.1 Mitigative Measures

The Applicant will employ BMPs to minimize the amount of fugitive dust created by the construction process. Tracking control at access roads and wetting surfaces are examples of BMPs that will be used to minimize fugitive dust. Based upon this, the Applicant anticipates nominal impacts to air quality. Therefore, no other mitigative measures are proposed.

6.5.2 Water Resources

6.5.2.1 Water Quality

The proposed Project may have minor, short term effects on water quality. Impacts on water quality are possible during the construction phase of the proposed Project, when sediment could possibly reach surface waters as excavation, grading, and construction traffic disturb the ground.

6.5.2.2 Mitigative Measures

The MPCA regulates construction activities that may impact storm water under the Clean Water Act. In the event that a National Pollutant Discharge Elimination System (NPDES) construction storm water permit and Stormwater Pollution Prevention Plan (SWPPP) is required for the proposed Project, the Applicant will obtain the permit and prepare a SWPPP. An NPDES permit is required for owners or operators for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. The SWPPP will outline strategies and steps that will be taken to prevent nonpoint source pollution discharging from construction areas.

Additionally, the proposed Zemple substation will have a crushed aggregate surface which will limit impacts to ground water and BMPs, such as silt fences, will be implemented in order to prevent or minimize water quality impacts during project construction. Using the previously outlined measures, no significant impacts to water quality are anticipated.

6.5.2.3 MnDNR Public Waters Inventory

The MnDNR Public Waters Inventory (PWI) identifies basins (lakes and wetlands) and watercourses over which the MnDNR has regulatory jurisdiction. The statutory definition of public water is found in Minn. Stat. § 103G.005, subd. 15 and 15a. No PWI basins or watercourses are present within the proposed Routes or proposed Substation Location. The Deer River, a PWI watercourse, is located approximately one-tenth of a mile southwest of the proposed 115 kV HVTL Route (Figure B-2). White Oak Lake, a PWI basin is located approximately one-half mile from the proposed 115 kV HVTL route (Figure B-2).

6.5.2.4 Mitigative Measures

Because there are no PWI basins or watercourses present within the routes or proposed Substation Location, no impacts to PWI waters are anticipated and no mitigative measures are proposed.

6.5.2.5 Wetlands

Wetland locations within the vicinity of the proposed Project area were initially identified using the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps. Subsequently, a desktop review was conducted to verify the presence and classification of the wetlands present within the proposed Routes and proposed Substation Location area. Wetlands are summarized in Table 15 and shown on Figure B-2.

Approximately 36 acres of wetland have been mapped within the proposed 115 kV HVTL route; this represents approximately 37 percent of the route. Alder thicket/shrub-carr (44 percent) and hardwood swamps (39 percent) are the dominant wetland types within the route, followed by sedge/wet meadows (16 percent) and shallow marshes (1 percent). Approximately 3 acres of wetland, including hardwood swamps and shrub swamps, have been mapped within the proposed 115 kV HVTL ROW; this represents approximately 23 percent of the ROW. The proposed alignment of the 115 kV HVTL would require five wetland crossings ranging in size from 12 feet to 835 feet. Because the maximum span length for this HVTL is 600 feet (+/- 100 feet for H-frame structures; Table 5) or 300 feet (+/-100 feet for monopole structures; Table 5), four of the wetland crossings which have crossing lengths less than 320 feet would likely be spanned. However, the wetland crossing that is 835 feet would likely require the placement of one or more poles within the wetland.

Approximately 5 acres of wetland have been mapped within the proposed 230 kV HVTL route; this represents approximately 40 percent of the route. Wetlands in the area include a sedge/wet meadow located north of US Hwy 2 (approximately 58 percent) an alder thicket/shrub-carr (approximately 42 percent). Approximately 1 acre of wetland, including sedge/wet meadows and shrub swamps, have been mapped within the proposed 230 kV HVTL ROW; this represents approximately 54 percent of the ROW. The proposed alignment for the 230 kV HVTL would require three wetland crossings ranging in size from 110 feet to 220 feet. Because the maximum span length for this HVTL is around 400 feet (+/- 200 feet; Table 5) all wetlands would likely be spanned.

Approximately 3 acres of wetland, including sedge/wet meadows, hardwood swamps, and shrub swamps have been mapped within the proposed 115 kV HVTL rebuild ROW; this represents approximately 25 percent of the ROW. The 115 kV HVTL rebuild would require 8 wetland crossings ranging in size from 50 feet to 410 feet. Because the maximum span length for this HVTL is 300 feet (+/- 100 feet; Table 5), each of these crossings would likely be spanned. However, it is possible that the 410-foot crossing would require the placement of a pole within the wetland.

Approximately 2 acres of wetlands have been mapped within the proposed Substation Location area; this represents approximately 19 percent of the total proposed Substation Location. A sedge/wet meadow and an alder thicket/shrub-carr each represent one-half of the wetland area mapped within in the proposed Substation Location.

Table 15 Acres of Wetland within Routes/ROW and Proposed Substation Location

Eggers & Reed Wetland Type	Wetland (acres)						
	115 kV HVTL Route		230 kV HVTL Route		115 kV HVTL Rebuild		Substation Location
	ROW	Route	ROW	Route	ROW	Route	
Shallow marsh	0	0.6	0	0	0	NA	0
Sedge/Wet meadow	0	5.7	1.0	2.9	0.2	NA	0.8
Hardwood swamp	2.0	14.1	0	0	0.2	NA	0
Alder thicket/Shrub-carr	1.0	15.8	0.4	2.1	2.2	NA	0.8
Total acres	**3.0**	**36.2**	**1.4**	**5.0**	**2.6**	**NA**	**1.6**

"NA" refers to not applicable because the 115 kV rebuild does not have a route associated with it.

6.5.2.6 Mitigative Measures

The Zemple Substation will be designed to avoid impacts to wetlands on the site. The transmission line will be designed to span wetlands to the extent possible. However, it is possible that one or more structures will need to be placed within wetlands; any necessary permits will be obtained after design is completed. When it is not feasible to span the wetland, construction crews will use several methods to minimize impacts:

- when possible, construction will be scheduled for when the ground is frozen;
- crews will attempt to take the shortest route when they access the wetland;
- the structures will be assembled on upland areas before they are brought to the site for installation; and
- when construction during winter is not possible, construction mats will be used where wetlands will be affected.

The Applicant will design the proposed Project to avoid and minimize wetland impacts, and will apply erosion control measures identified in the Minnesota Pollution Control Agency (MPCA) Storm Water BMPs Manual, such as using silt fencing to minimize impacts to water quality.

As previously stated in 6.5.2.1, the MPCA regulates construction activities that may impact storm water under the Clean Water Act. In the event that a National Pollutant Discharge Elimination System (NPDES) construction storm water permit and Stormwater Pollution Prevention Plan (SWPPP) is required for the proposed Project, the Applicant will obtain the permit and prepare a SWPPP. An NPDES permit is required for owners or operators for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. The SWPPP will outline strategies and steps that will be taken to prevent nonpoint source pollution discharging from construction areas.

6.5.2.7 Floodplain

Using maps created by the Flood Emergency Management Agency (FEMA), no mapped floodplain resources were identified within the routes or proposed Substation Location[12].

6.5.2.8 Mitigative Measures

No impacts to floodplain resources are anticipated; therefore, no mitigative measures are proposed.

6.5.3 Flora

The MnDNR Gap Analysis Program (GAP) Land Cover data set[13] was used to identify land cover types in the vicinity of the Project area. GAP land cover types within the routes and proposed Substation Location are shown on Figure B-3.

The GAP land cover data identifies 31 percent of the land within the proposed 115 kV HVTL ROW as cropland/grassland. Additional land cover types include: upland shrub (28 percent), lowland shrub (21 percent), transportation/roads (7 percent), sedge meadow (6 percent), and black ash swamp (7 percent). As shown on aerial photographs (Figure B-3), a notable portion of the ROW, in particular south of US Hwy 2, is actually industrial land.

The GAP land cover data identifies three land cover types within the proposed 230 kV HVTL ROW as upland shrub (55 percent), transportation/roads (23 percent), and cropland (22 percent)(Figure B-3).

The GAP land cover data identifies five land cover types within the proposed 115 kV HVTL rebuild as cropland (61 percent), upland shrub (19 percent), sedge meadow (10 percent), broadleaf sedge/cattail (5 percent), and transportation/roads (5 percent).

The GAP land cover data identifies approximately 56 percent of the land area in the proposed Substation Location as upland shrub, with cropland comprising the remaining 44 percent of the area. However, a notable portion of the proposed Substation Location is actually identified as industrial since a substation is already present within the area. In addition, although not mapped by the GAP land cover dataset, the proposed Substation Location area also contains wetland areas (Figure B-3).

6.5.2.9 Mitigative Measures

Impacts to non-forested areas will be temporary and will primarily occur during construction of the proposed Project. To minimize impacts to trees in the Project area, the Applicants will limit tree clearing and removal to the transmission line ROW, areas that limit construction access to the Project area, and areas that impact the safe operation of the facilities. Trees outside the ROW that may need to be trimmed or removed will primarily include trees that are unstable and could potentially fall into the transmission facilities. The Applicant will work with and compensate landowners for removal of trees not in the ROW.

Construction equipment has the potential to spread noxious weed-propagating material to new locations. The Applicant will comply with Minnesota noxious weed laws as described in Minn. Stat. § 18.75 to 18.91 and avoid the transport of state prohibited noxious weeds as well as secondary noxious weeds on the Itasca County weed list. All areas disturbed by construction of the transmission lines will be reseeded using a native seed mix appropriate to the site.

6.5.4 Fauna

No MnDNR Wildlife Management Areas (WMA) or USFWS Waterfowl Production Areas (WPA) are located within the vicinity of the proposed Routes or the proposed Substation Location area. However, the croplands, grasslands, shrublands, and wetlands provide habitat for a variety of fauna that are commonly found in rural areas. These species may include deer, small mammals, waterfowl, raptors, perching birds, and amphibians. Because much of the Project area is located within or adjacent to an industrial area, fauna present in the area are likely adapted to high levels of anthropogenic disturbance. Therefore it is not likely that the construction, operation, or maintenance of the proposed Project will have any notable effect on fauna present in the area.

The primary potential impact presented to fauna by transmission lines is the potential injury and death of migratory birds such as raptors, waterfowl, and other large bird species. The electrocution of large birds, such as raptors, is more commonly associated with small distribution lines than large transmission lines. However, birds have the potential to collide with all elevated structures, including transmission lines. Avian collisions with transmission lines can occur in proximity to agricultural fields that serve as feeding areas, wetlands and water features, and along riparian corridors that may be used during migration. The majority of the Project area is located in or adjacent to an industrial area with several existing transmission lines (Figure B-3). Because of this, new impacts to wildlife species from the proposed Project are not anticipated.

6.5.2.10 Mitigative Measures

Displacement of fauna is anticipated to be minor and temporary in nature, and no long-term population-level impacts are anticipated from the proposed Project. The Applicant will construct the transmission line according to Avian Power Line Interaction Committee (APLIC) recommended safety design standards regarding avian collisions and avian electrocution with HVTLs[14]. In addition, the Applicant will work with the MnDNR and the USFWS to identify any areas that may require marking transmission line shield wires and/or using alternative structures to reduce the likelihood of avian collisions.

6.6 Rare and Unique Natural Resources

The USFWS list of federally threatened, endangered, proposed, and candidate species was reviewed[15] to obtain information on federally-listed species that could be present in the Project area. According to the USFWS list, Itasca County, where the proposed Project is located, is within the overall range of the Canada lynx (*Lynx Canadensis*; federally threatened). Due to the industrial nature of the Project area and

the lack of desirable Canada lynx habitat (dense forest), it is not likely that Canada lynx inhabit the Project area.

The MnDNR Natural Heritage Information System (NHIS) database was queried in January of 2013 in order to obtain information on rare and unique natural resources within one mile of the Project area. According to the NHIS database, two bald eagle nests (*Haliaeetus leucocephalus*; state-special concern) were documented over one-half mile from the Project area (Figure B-1). Both of these NHIS records were documented in nesting areas along the Deer River. Bald eagles generally select nest sites in forested areas adjacent to lakes or rivers[16]. Because the southern portion of the proposed 115 kV HVTL route, which is the closest to the Deer River and White Oak Lake, is highly industrial, it is not likely that bald eagles would nest within the Project area.

According to the NHIS database, no other state or federally listed species have been documented within one mile of the Project area. In addition, according to the NHIS database, Minnesota County Biological Survey (MCBS) native plant community Geographical Information System (GIS) shapefile[17], and MCBS Sites of Biodiversity Significance GIS shapefile[18], no rare native plant communities have been documented within one mile of the Project area.

The MnDNR and USFWS were contacted by letter on January 10, 2013 regarding possible impacts of the proposed Project on rare and unique resources. At present, no comments have been received from the MnDNR or USFWS.

6.6.1.1 Mitigative Measures

Because the proposed Project is located within or adjacent to an industrial area, with several existing transmission lines, it is not likely that the proposed Project will result in significant impacts to Canada lynx or bald eagle populations in the area. As previously mentioned, the Applicant will construct the transmission line according to APLIC recommended safety design standards regarding avian collisions and avian electrocution with HVTLs[14].

The proposed Project will be designed to minimize impacts to rare and unique resources to the extent practicable. In the event that avoiding impacts to threatened or endangered species is not feasible, the Applicant will work with regulatory agencies to identify appropriate measures to minimize impacts, as well as compensatory mitigation for impacts that cannot be avoided.

7.0 Agency Involvement, Public Participation and Required Permits and Approvals

7.1 Project Notices to Agencies, LGUs, and Interested Parties

On November 12, 2012, Minnesota Power submitted pre-filing notice letters to the Local Governmental Unit (LGU) within the Project area to provide the LGU notice of the proposed Project, requesting comments and concerns, and allowing the LGU the opportunity to request a meeting to discuss the proposed Project. This LGU letter is included in Appendix D. At present no comments have been received.

On December 7, 2012, Minnesota Power sent notice letters describing the proposed Project, requesting comments, and announcing a public informational meeting scheduled for January 7, 2013 to pertinent federal and state agencies, local government units, and nearby landowners (Appendix E). A notice for the public informational meeting was published in the Grand Rapids Herald Review on Thursday December 20, 2012.

The public informational meeting was held on January 7, 2013 from 6:00 to 7:30 p.m. at the White Oak Inn and Suites in Deer River to inform landowners and public officials of the proposed Project and to gather input to be used in further assessing Project impacts. Approximately eight people attended the meeting. A copy of the notice letter, newspaper notice, and open house attendee list is included in Appendix E.

7.2 United States Fish and Wildlife Service

On January 10, 2013, Barr sent a letter to USFWS requesting review of the proposed Project. At present no comments have been received.

7.3 Minnesota Department of Natural Resources

On January 10, 2013, Barr sent a letter to MnDNR requesting review of the proposed Project. At present no comments have been received.

7.4 Minnesota State Historic Preservation Office

On December 7, 2012 the Applicant mailed a letter to SHPO notifying the agency of the Proposed Project and public meeting. On December 24, 2012, the Applicant received a letter from SHPO stating the following: “Based on our review of the project information, we conclude that there are no properties listed in the National Register or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.” (Appendix F).

7.5 Identification of Landowners

A list of landowners is included in Appendix C. Addresses have been redacted from the landowner list and comment forms due to privacy concerns.

7.6 Required Permits and Approvals

In addition to a Route Permit, other federal, state, and local permits could potentially be required for the proposed Project. These are identified below in Table 16.

Table 16 Potential Permits Required

Permit	Jurisdiction
Federal	
Section 404 Jurisdictional Determination/Permit	U.S. Army Corps of Engineers (ACOE)
State	
Route Permit	MPUC
Utility Permit	MnDOT
NPDES Construction Stormwater Permit	MPCA
Section 401 Water Quality Certification	MPCA (required if the ACOE requires an individual permit for wetland dredging and filling activities, this certification is required)
Local	
Minnesota Wetland Conservation Act Certification	Itasca County

For the other permits listed in Table 16, and any additional permit requirements identified during subsequent agency consultations, the Applicant will acquire the necessary authorizations and develop the appropriate plans associated with any permit or authorization (e.g., stormwater pollution prevention management plan prior to construction).

7.6.1 Federal Permits

7.6.1.1 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (ACOE) regulates the placement of fill material into wetlands that are located adjacent to, or hydraulically connected to, interstate or navigable waters under the authority of Section 404 of the Clean Water Act. After coordination and application submission, authorization from the ACOE will likely fall under the utility line discharge provision of a Regional General Permit (RGP-3-MN) which provides for utility line discharges. Notification will be required because the proposed Project will cross more than 500 feet of wetland and require direct fill for placement of structures in wetlands.

7.6.2 State of Minnesota Permits

7.6.2.1 Minnesota Public Utilities Commission

Minn. Stat. § 216E.03, subd. 2, provides that no person may construct a HVTL without a Route Permit from the Commission. The Applicant is seeking a Route Permit from the Commission with this Application.

7.6.2.2 Minnesota Department of Natural Resources

The MnDNR Division of Lands and Minerals regulates utility crossings on, over or under any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minn. Stat. § 84.415 and Minn. R., chapter 6135. The MnDNR Division of Waters requires a Public Waters Work Permit for any alteration of the course, current, or cross-section below the ordinary high water level of a Public Water or Watercourse. No such alterations are anticipated for the proposed Project.

7.6.2.3 Minnesota Pollution Control Agency

MPCA requires an NPDES construction storm water permit and SWPPP for owners or operators for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre. The MPCA may also require the proposed Project to have an individual NPDES/SDS construction storm water permit. Most construction activities are covered by the general NPDES storm water permit for construction activity. Individual NPDES/SDS permits may be required for very large projects or projects that have a high potential to impact environmentally sensitive areas. The Applicant will determine if their project exceeds the one acre threshold, and, if so, obtain the permit or notice of permit coverage from the MPCA. The MPCA would notify the Applicant if they will need to obtain an individual NPDES/SDS permit for their project.

7.6.3 Local Permits

Once the Commission issues a Route Permit, zoning, building and land use regulations and rules are preempted per Minn. Stat. § 216E.10, subd. 1. Applicable permits from Itasca County concerning road access, road ROW, and wetlands under Minnesota Wetland Conservation Act (WCA) will be secured as needed for the proposed Project.

8.0 References

[1] Minnesota Department of Health, "EMF White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options," 2002.

[2] Natural Resource Council, "Possible Health Effects of Exposure to Residential Electric and Magnetic Fields," 1997.

[3] NIEHS. [Online]. Available: www.niehs.nih.gov/health/topics/agents/emf/.

[4] Minnesota Department of Natural Resources, "Minnesota Department of Natural Resources Ecological Classification System," January 2013. [Online]. Available: http://www.dnr.state.mn.us/ecs/index.html. [Accessed January 2013].

[5] Itasca County, "Itasca County Maps," 2013. [Online]. Available: http://www.co.itasca.mn.us/Home/Property%20Info/maps/Pages/default.aspx. [Accessed January 2013].

[6] Minnesota Pollution Control Agency, "A Guide to Noise Control in Minnesota," 2008. [Online]. Available: http://www.pca.state.mn.us/index.php/view-document.html?gid=5355.

[7] United States Census, 2000. [Online]. Available: http://censtats.census.gov/data/MN/1602741480.pdf. [Accessed January 2013].

[8] Wikipedia, "Deer River, Minnesota," 2013. [Online]. Available: http://en.wikipedia.org/wiki/Deer_River,_Minnesota. [Accessed January 2013].

[9] Wikipedia, "Cohasset, Minnesota," 2013. [Online]. Available: http://en.wikipedia.org/wiki/Cohasset,_Minnesota. [Accessed January 2013].

[10] Census Data, "Deer River City Data," [Online]. Available: http://www.city-data/city/Deer-River-Minnesota.htm. [Accessed January 2013].

[11] U.S. Environmental Protection Agency, "Currently Designated Nonattainment Areas for Critical Pollutants," 2012. [Online]. Available: http://www/epa/gov/oaqps001/greenbk/ancl.html.

[12] Federal Emergency Management Agency, *FEMA Q3 Floodways,* 2003.

[13] Minnesota Department of Natural Resources, *GAP Land Cover. GIS shapefile,* 2002.

[14] Avian Power Line Interaction Committee, *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006,* Washington, D.C. and Sacramento, CA: Edison Electric Institute, APLIC, and the California Energy Commission, 2006.

[15] United States Fish and Wildlife Service, "County Distribution of Minnesota's Federally Threatened, Endangered, and Candidate Species," 2013. [Online]. Available: http://www.fws.gov/midwest/endangered/lists/minnesot-cty.html. [Accessed January 2013].

[16] Minnesota Department of Natural Resources, "Minnesota Rare Species Guide; Haliaeetus leucocephalus," 2013. [Online]. Available: http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ABNKC10010. [Accessed January 2013].

[17] Minnesota Department of Natural Resources, *Minnesota County Biological Survey – Native Plant Communities. GIS shapefile,* 20xx.

[18] Minnesota Department of Natural Resources, *Minnesota County Biological Survey Sites of Biodiversity Significance. GIS shapefile.,* 2002.

9.0 Definitions

Following are a list of definitions used in this Application:

Avian	Of or relating to birds.
A-weighted Scale	The sensitivity range for human hearing.
Breaker	Device for opening a circuit.
Bus	An electrical conductor that serves as a common connection for two or more electrical circuits; may be in the form of rigid bars or stranded conductors or cables.
Conductor	A material or object that permits an electric current to flow easily.
Corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding conductors.
Double-circuit	The construction of two separate circuits at the same or different voltage on the same structures to increase capacity of the line.
Electric Field (EF)	The field of force that is produced as a result of a voltage charge on a conductor or antenna.
Electromagnetic	The term describing the relationship between electricity and magnetism; a quality that combines both magnetic and electric properties.
Electromagnetic Fields (EMF)	The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric and magnetic fields. Electric and magnetic fields arise from the flow of electricity and the voltage of a line. The intensity of the electric field is related to the voltage of the line. The intensity of the magnetic field is related to the current flow through the conductors.

Excavation	A cavity formed by cutting, digging, or scooping.
Fauna	The collective animals of any place or time that live in mutual association.
Flora	The collective plants of any place or time that live in mutual association.
Grading	To level off to a smooth horizontal or sloping surface.
Grounding	To connect electrically with a ground.
Habitat	The place or environment where a plant or animal naturally or normally lives and grows.
High Voltage Transmission Lines (HVTL)	Overhead and underground conducting lines of either copper or aluminum used to transmit electric power over relatively long distances, usually from a central generating station to main substations. They are also used for electric power transmission from one central station to another for load sharing. High voltage transmission lines typically have a voltage of 69 kV or more.
Hydrocarbons	Compounds that contain carbon and hydrogen, found in fossil fuels.
Ionization	Removal of an electron from an atom or molecule. The process of producing ions. The electrically charged particles produced by high-energy radiation, such as light or ultraviolet rays, or by the collision of particles during thermal agitation.
Magnetic Field (MF)	The region in which the magnetic forces created by a permanent magnet or by a current-carrying conductor or coil can be detected. The field that is produced when current flows through a conductor or antenna.
Mitigate	To lessen the severity of or alleviate the effects of.

Neutral to Earth Voltage (NEV)	The term NEV is used to describe a measurable level of voltage which may occur between a metal object and the adjacent floor or earth.
Oxide	A compound of oxygen with one other more positive element or radical.
Ozone	A form of oxygen in which the molecule is made of three atoms instead of the usual two.
Raptor	A member of the order Falconiformes, which contains the diurnal birds of prey, such as the hawks, harriers, eagles and falcons.
Sediment	Material deposited by water, wind, or glaciers.
Scientific and Natural Area	A program administered by the MnDNR with the goal to preserve and perpetuate the ecological diversity of Minnesota's natural heritage, including landforms, fossil remains, plant and animal communities, rare and endangered species, or other biotic features and geological formations, for scientific study and public edification as components of a healthy environment.
Site of Biodiversity Significance	The Minnesota County Biological Survey collects baseline data on the distribution and ecology of native plant communities. At the conclusion of the work, the MCBS assigns a biodiversity significance rank to each site surveyed.
Stray Voltage	"Stray voltage" is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.

Substation	A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.
Ultraviolet Radiation	A portion of the electromagnetic spectrum with wavelengths shorter than visible light.
Voltage	Electric potential or potential difference expressed in volts.
Waterfowl	A bird that frequents water; especially a swimming game bird (as a duck or goose) as distinguished from an upland game bird or shorebird.
Waterfowl Production Area (WPA)	Waterfowl Production Areas preserve wetlands and grasslands critical to waterfowl and other wildlife. These public lands, managed by the U.S. Fish and Wildlife Service, were included in the National Wildlife Refuge System in 1966 through the National Wildlife Refuge Administration Act.
Wetland	Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs and similar areas.
Wildlife Management Area (WMA)	Wildlife Management Areas are part of Minnesota's outdoor recreation system and are established to protect those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing and other compatible recreational uses.

10.0 Acronyms

AC	Alternating Current
ACOE	U.S. Army Corps of Engineers
ALJ	Administrative Law Judge
Applicant	Minnesota Power
Application	Route Permit Application
Barr	Barr Engineering Company
BMP	Best Management Practice
BPA	Bonneville Power Administration
Brookings Project	Brookings County – Hampton 345 kV Route Permit proceeding
Commission	Minnesota Public Utilities Commission
Company	Northern States Power Company
dBA	A-weighted sound level in decibels
DC	Direct Current
ECS	Ecological Classification System
EF	Electric Field
ELF	Extremely Low Frequency
EMF	Electric and Magnetic Fields
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GAP	Gap Analysis Program
GIS	Geographic Information System
HVTL	High Voltage Transmission Line
kV	Kilovolt
kV/m	Kilovolts Per Meter
L	Level Descriptors or Statistical Sound Levels
L_{10}	the dBA that may be exceeded 10 percent of the time within an hour
L_{50}	the dBA that may be exceeded 50 percent of the time within an hour
LGU	Local Government Unit
MCBS	Minnesota County Biological Survey
MF	Magnetic Field
mG	milliGauss
MnDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
NAC	Noise Area Classification
NESC	National Electric Safety Code
NEV	Neutral to Earth Voltage
NHIS	National Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ppm	parts per million
PPSA	Power Plant Siting Act
Project	Minnesota Power Deer River HVTL Project

PWI	MnDNR Public Water Inventory
RGP	Regional General Permit
SHPO	Minnesota State Historic Preservation Office
SBS	Site of Biodiversity Significance
SNA	Scientific and Natural Area
SWPPP	Stormwater Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service
VOR	Very-High-Frequency Omni-Directional Range
WCA	Wetland Conservation Act
WMA	Wildlife Management Area
Working Group	Interagency Working Group
WPA	Waterfowl Production Area

APPENDIX A

APPLICANT'S NOTICE LETTER TO COMMISSION OF INTENT TO USE ALTERNATIVE PERMITTING PROCESS

minnesota power
AN ALLETE COMPANY

30 west superior street / duluth, minnesota 55802-2093 / fax: 218-723-3955 /www.allete.com

David R. Moeller
Senior Attorney
218-723-3963
dmoeller@allete.com

January 28, 2013

VIA ELECTRONIC FILING

Dr. Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101

Re Notification of Intent to File Route Permit Application Under the Alternative Permitting Process for the Proposed Minnesota Power Deer River Project- Itasca County, Minnesota.

Dear Dr. Haar:

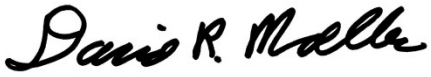
In accordance with Minn. Rules 7850.2800, subp. 2, Minnesota Power hereby notifies the Minnesota Public Utilities Commission (MPUC) of its intent to submit an application for a route permit for the Deer River Project (Project) pursuant to the alternative permitting procedures in Minn. Rules 7850.2800 to 7850.3900.

The proposed project includes constructing a new, approximately 0.7-mile-long, 115 kilovolt (kV) high voltage transmission line switched from an existing Great River Energy existing transmission line to a proposed Enbridge Substation. In addition, Minnesota Power would rebuild and expand its existing Deer River Substation and include two 230 kV transmission line exits that switch to an existing CAPX 230 kV high voltage transmission line. Minnesota Power would also remove approximately seven miles of its existing 28 Line adjacent to the project area. The project is needed to accommodate anticipated load growth and improve reliability and long-term load-serving capacity.

Minnesota Power plans to file the application in March 2013 and will work with the MPUC and Department of Commerce staff to address any questions and/or comments in order to expedite the application's acceptance and completion of the environmental assessment.

If you have any questions or concerns please contact myself or Dan McCourtney at (218) 355-3515 or by email at dmmcourtney@allete.com.

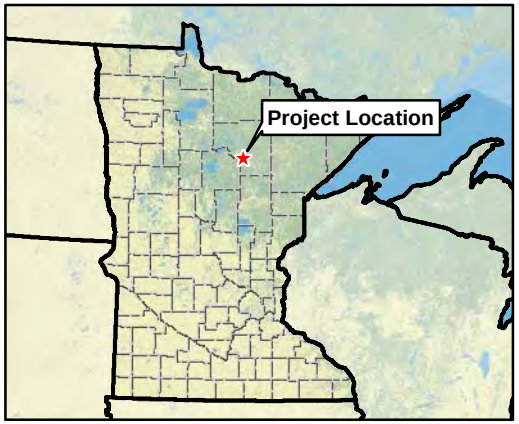
Yours truly,



David R. Moeller

kl
Attachment
c: Service list
Dan McCourtney (Minnesota Power)

Barr Footer: ArcGIS 10.0, 2012-12-06 11:42:53.847000 File: \\barr.com\GIS\Projects\23\31\1105\Maps\Reports\20121206_Notice_Letter\Figure 1 - Project Overview.mxd User: JJL2



115 T-Line to remove

Proposed 115

Proposed 230

PWI Watercourse

PWI Basin

Proposed Sub Location

PLS Section

Municipal Boundary

County Boundary

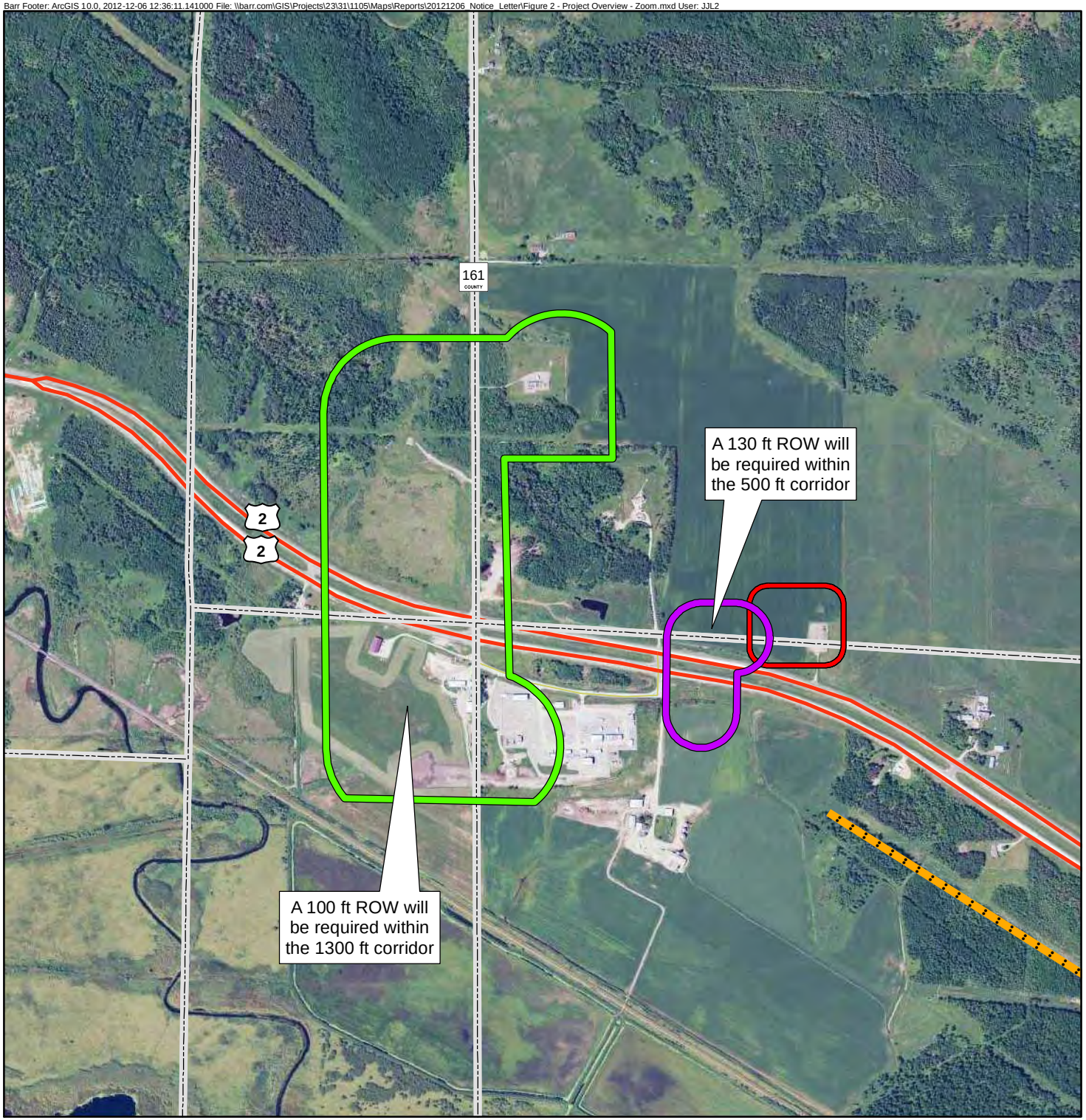
Image Source: 2010 Farm Service Agency

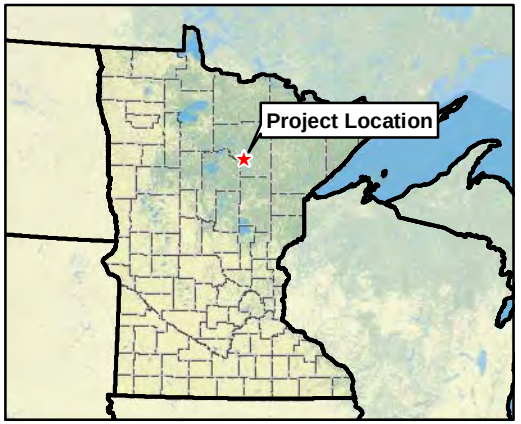
N

0 0.5 1 2 Miles

Figure 1 - PROJECT OVERVIEW

Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN





115 T-Line to remove

Proposed 115

Proposed 230

Proposed Sub Location

PLS Section

Image Source: 2010 Farm Service Agency

N

0 500 1,000 2,000 Feet

Figure 2 - PROJECT DETAILED MAP

Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

STATE OF MINNESOTA	)	AFFIDAVIT OF SERVICE VIA
	) ss	ELECTRONIC FILING
COUNTY OF ST. LOUIS	)	

Kristie Lindstrom of the City of Duluth, County of St. Louis, State of Minnesota, says that on the 28th day of January, 2013, she served the attached Notice of Intent in accordance with the Power Plant Siting Act, Minn. Stat. § 216E.05, subd. 3, to the Minnesota Public Utilities Commission and Department of Commerce via electronic filing. The remaining parties on the attached service list were served as so indicated on the list.

/s/ Kristie Lindstrom

Subscribed and sworn to before
me this 28th day of January, 2013.

/s/ Bernadette R Nelson

Notary Public - Minnesota
My Commission Expires Jan. 31, 2015

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Julia	Anderson	Julia.Anderson@ag.state.mn.us	Office of the Attorney General-DOC	1800 BRM Tower 445 Minnesota St St. Paul, MN 551012134	Electronic Service	Yes	OFF_SL_12-1163_CN-12-1163
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Derek	Brandt	N/A	Hartford Group Inc.	PMB 506 7455 France Ave S Edina, MN 55435-4702	Paper Service	No	OFF_SL_12-1163_CN-12-1163
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George	Crocker	gwillc@nawo.org	North American Water Office	PO Box 174 Lake Elmo, MN 55042	Paper Service	No	OFF_SL_12-1163_CN-12-1163
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Huck	Finn	huck.finn@apigroupinc.us	API Construction Company	1100 Old Hwy 8 NW St. Paul, MN 55113	Paper Service	No	OFF_SL_12-1163_CN-12-1163
Dale	Fredrickson			12406 347th Street Lindstrom, MN 55045	Paper Service	No	OFF_SL_12-1163_CN-12-1163
Jenny	Frost	N/A	Ulteig Engineers	c/o Jason Hoskins 4285 Lexington Ave N Saint Paul, MN 55126	Paper Service	No	OFF_SL_12-1163_CN-12-1163
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Michael	Pangborn	N/A	NextEra Energy Resources	14000 Sundial Ct Eden Prairie, MN 55346	Paper Service	No	OFF_SL_12-1163_CN-12-1163
Bob	Patton	bob.patton@state.mn.us	MN Department of Agriculture	625 Robert St N Saint Paul, MN 55155-2538	Electronic Service	No	OFF_SL_12-1163_CN-12-1163
Angela	Piner	angela.piner@hdrinc.com	HDR, Inc.	Suite 600 701 Xenia Avenue South Suite 600 Minneapolis, MN 55416	Paper Service	No	OFF_SL_12-1163_CN-12-1163
Jay	Porter	jporter@GREnergy.com	Great River Energy	12300 Elm Creek Blvd Maple Grove, MN 55369	Paper Service	No	OFF_SL_12-1163_CN-12-1163

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Stoei	Rivesllp	N/A		33 S 6th St Ste 4200 Minneapolis, MN 55402	Paper Service	No	OFF_SL_12-1163_CN-12-1163
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Glen	Skarbakka	N/A	Great River Energy	12300 Elm Creek Blvd Maple Grove, MN 55369	Paper Service	No	OFF_SL_12-1163_CN-12-1163
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Steven	Swenson	N/A	Pipestone Publishing	115 2nd St NE Pipestone, MN 56164	Paper Service	No	OFF_SL_12-1163_CN-12-1163
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Karen	Turnboom	karen.turnboom@newpagecorp.com	NewPage Corporation	100 Central Avenue Duluth, MN 55807	Electronic Service	No	OFF_SL_12-1163_CN-12-1163
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Jeff	Vetsch	N/A	CERTs	112 Norwood St New London, MN 56273	Paper Service	No	OFF_SL_12-1163_CN-12-1163

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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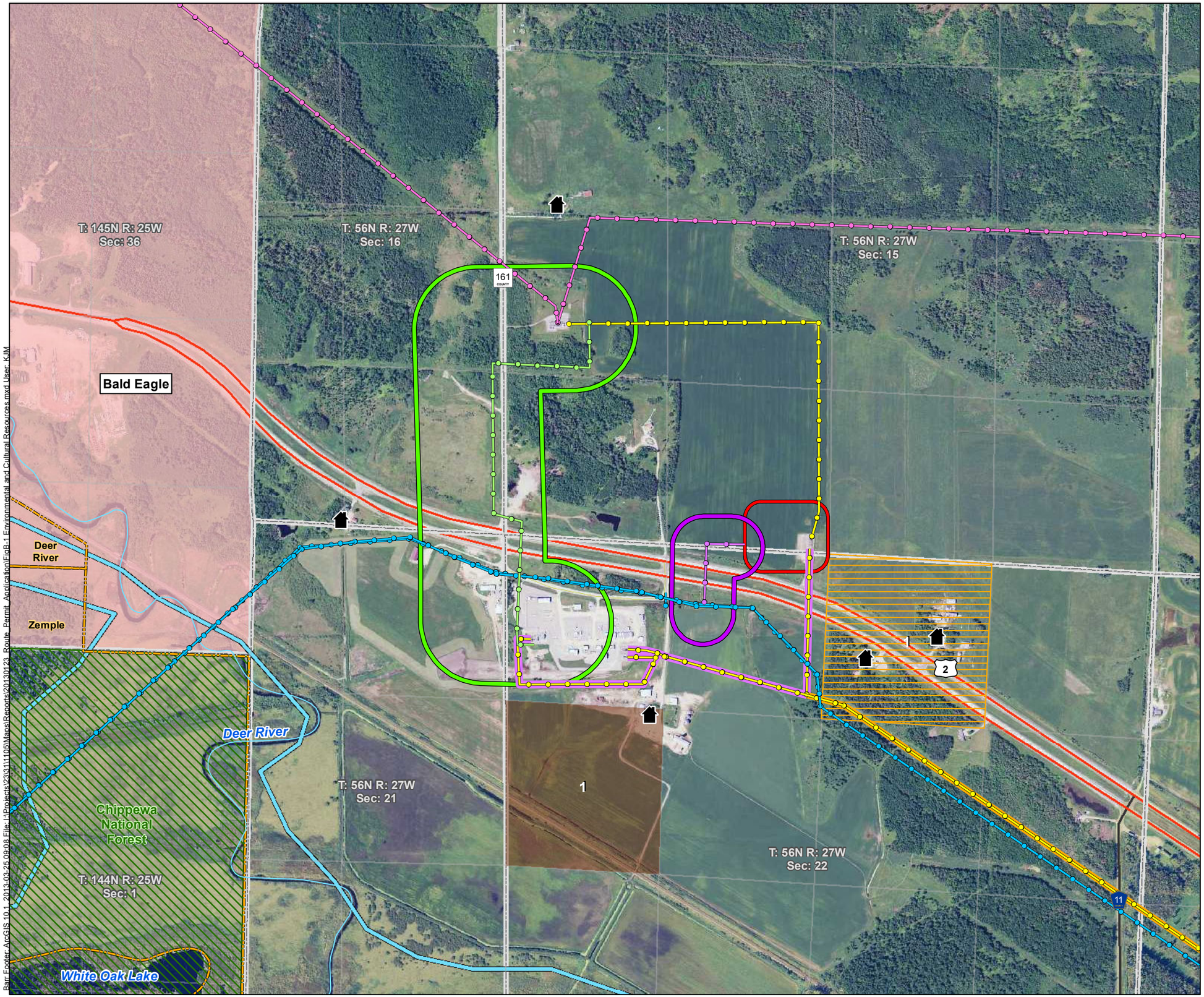
Laurance R.	Waldoch		Lindquist & Vennum	4200 IDS Center 80 South 8th Street Minneapolis, MN 554022274	Paper Service	No	OFF_SL_12-1163_CN-12-1163
Guy	Wolf		Board Member of Clean Wisconsin	N3421 Mohawk Valley Road Stoddard, WI 54658	Paper Service	No	OFF_SL_12-1163_CN-12-1163

kari_krause@yahoo.com; karensouthern@hotmail.com; scott.johnson@ci.medina.mn.us; suzz@visi.com; mmm123usa@gmail.com; vtwwtv@gmail.com; twodogdeb@aol.com; noofdog@gmail.com; bcbbwca@gmail.com; balm38@yahoo.com; lonabrams@yahoo.com; TPORTER@REYNOLDSINC.COM; john@nationalpoleandstructure.com; jthayer@rockfordconstruction.com; ttadych@atcllc.com; bruce@ranww.org; tscriven@rvtcorp.com; bbfai@frontiernet.net; cftownship@frontiernet.net; michellemcmorrow@yahoo.com; rickscherping@hotmail.com; peteadelmann@yahoo.com; jcardozo@mobilemini.com; marshman1@hotmail.com; dbpasse@embarqmail.com; nicolairepair@embarqmail.com; be682@msn.com; renedy@msn.com; mariner@eldinc.com; charles_koen@msn.com; mike@scrupleshaircare.com; msp@sei.cmu.edu; dimiller55@means.net; bettyz@means.net; ljvorwerk@yahoo.com; ru4longboarding@yahoo.com; o_hogwash@yahoo.com; barbara@powersys.com; overland@legalectric.org; LCrum@lisacrumlaw.com; cynat@bevcomm.net; ninjette@msn.com; org49ero@yahoo.com; david.birkholz@state.mn.us; cheryl.olsen@metc.state.mn.us; tricia.debleeckere@state.mn.us; kate.oconnell@state.mn.us; jim.larsen@metc.state.mn.us; ruccolo@fresh-energy.org; swnyhus@flaherty-hood.com; garletz@mncounties.org; pmaccabec@visi.com; melissa.doperalski@state.mn.us; tkaufman@wellingtonmgt.com; karen.kromar@state.mn.us; becky.coates@psiusa.com; andrew.koebrick@state.mn.us; stacy.kotch@state.mn.us; elise.doucette@pca.state.mn.us; jamie.schrenzel@state.mn.us; billheaney@billheaney.com; hartman.larry@gmail.com; pjholman@frontiernet.net; elfe0012@umn.edu; p.griese@mchsi.com; tb3bars69@yahoo.com; smccurry@visi.com; stevebubb@gmail.com; denoonan20@msn.com; cjbljb@gmail.com; rhenry@tcwr.net; goffwe@earthlink.net; timhunstad@hotmail.com; ehlen@mchsi.com; dale.beckmann@westwoodps.com; dgorshe@iret.com; kevsuealex@aol.com; dhickeymn@yahoo.com; callis2@embarqmail.com; bambrose@grenergy.com; MStrohfus@GREnergy.com; msteckelberg@grenergy.com; bschultz@houstonengineeringinc.com; virginiaantony@edinarealty.com; brian.r.zelenak@xcelenergy.com; kmaclaury@mncee.org; adina.r.florea@xcelenergy.com; brown.andrew@dorseylaw.com; jdrawz@fredlaw.com; brian.meloy@leonard.com; james.bertrand@leonard.com; vherring@briggs.com; shirleymidtownphillips@msn.com; cesia.kearns@sierraclub.org; tedebearmark@msn.com; matthias@projectresources.net; kswenson@windpower.com; dgerber@cleanwater.org; dmorris@ilsr.org; ward06counciloffice@ci.minneapolis.mn.us; fignat@comcast.net; scottw@wagnergreenhouses.com; gmarkegard@ci.bloomington.mn.us; brian.long@ulteig.com; jgale@fpdpower.com; pbartell@volco.net; rminer@marcyconstruction.com; bhegerle@marcyconstruction.com; mvezina@muellersales.com; barbarab@acornenvironmental.com; joshua.bird@ge.com; sindust1@msn.com; jlee@barr.com; lsegroves@barr.com; justin@geronimowind.com; chuckh@electrotech-inc.com; hdrider4710@aol.com; wooder59@yahoo.com; aemahan@me.com; jafgol@gmail.com; jamie.s.nickel@comcast.net; themoellers_2@hotmail.com; m.raquet@comcast.net; danders542000@gmail.com; lselingerx@aol.com; stuelpner@comcast.net; ajbuckalew@yahoo.com; cdlee1@comcast.net; shawbad@msn.com; jjeisenmann@comcast.net; pamroge@gmail.com; annciardelli@gmail.com; lorapinetree@gmail.com; shaneske@hibbing.k12.mn.us; tswafford@umsi.us; kjp@ibew160.org; drohl24057@aol.com; james_9mm@yahoo.com; jmkocer@myclearwave.net; maebowman@aol.com; chad@ibewlocal343.org; wcook@rpu.org; jmalwitz@yahoo.com; niftyfarm@myclearwave.net;

cowguy@kmwb.net; lorrykzbag@hotmail.com; mary.greening@co.dodge.mn.us; sgau@sleepyeyetel.net; lvscheffler@hotmail.com; beaukennedy@yahoo.com; baertlein.cheryl@mayo.edu; rtlyke@pitel.net; muller.sharon@mayo.edu; mdavidson@isd2899.k12.mn.us; josephmorse@hotmail.com; patrick.anderson@lee.net; mapanorman@usfamily.net; stephanie.nyhus@state.mn.us; rschumacher@is-ea.com; kristines@mvec.net; lorift@utplus.com; fcswcd@bevcomm.net; jahffmn@bevcomm.net; benjamin.schaefer@dnr.state.mn.us; kevin.mixon@dnr.state.mn.us; slwithers@nfpinc.com; pands@nobleswildblue.com; phydev@swrdc.org; michelle.bouta@umvrdc.org; amsjoe350@yahoo.com; dplagge@fageneng.com; crude@mvtvwireless.com; pat_stengel@hotmail.com; ddrusch@redred.com; rschroeder@frandsenbank.com; julie@redwoodfalls.org; celtichand56@yahoo.com; darrenk@kenningoutsource.com; fassettj@iemenergy.com; stevelisa9@aol.com; bmo2504@juno.com; sjewell02@hamlineuniversity.edu; sjnotch@albanytel.com; cmueller@wildblue.net ; jckueb@clearwire.net; llegatt@yahoo.com; rothaus@trefoilcultural.com; tom@nationalconductor.com; annetter@nationalconductor.com; wayne@wcif.org; katstradley@gmail.com; naherzog@msn.com; toddmorse@cableone.net; jacquijovonovich@gmail.com; jrwright@bemidji.k12.mn.us; kageb1@gvtel.com; dmelvie@wiktel.com; keevinkellyn@swiftel.net; sswartz@braunintertec.com; skdelong@polarcomm.com; mbates@dadco.com; amy@duraflexinc.com; timothy_fehr@transcanada.com; marco.trivellizzi@kiewit.com; pkennon@acciona-na.com; mir-mir-z@suddenlink.net; chad.galloway@arionenergy.com; masnd76@cox.net; halicarlson@kmts.ca;

APPENDIX B

ENVIRONMENTAL FEATURE AND RESOURCE MAPS



Existing 115kV Line

Existing 69kV Line

CapX2020 230kV Line

115 kV HVTL Proposed for Removal

Proposed 115 kV Rebuild

Proposed 115kV Alignment

Proposed 115 kV HVTL Route

Proposed 230kV Alignment

Proposed 230 kV HVTL Route

Proposed Substation Location

Residence

PWI Watercourse

PWI Basin

National Forest Boundary

Rare Natural Feature*

Archaeological Site

Historic Site

PLS Quarter-Quarter Section

PLS Section

Municipal Boundary

* Natural Heritage Information System Rare Features Data Copyright 2012 State of Minnesota, Department of Natural Resources

Image Source: 2010 Farm Service Agency

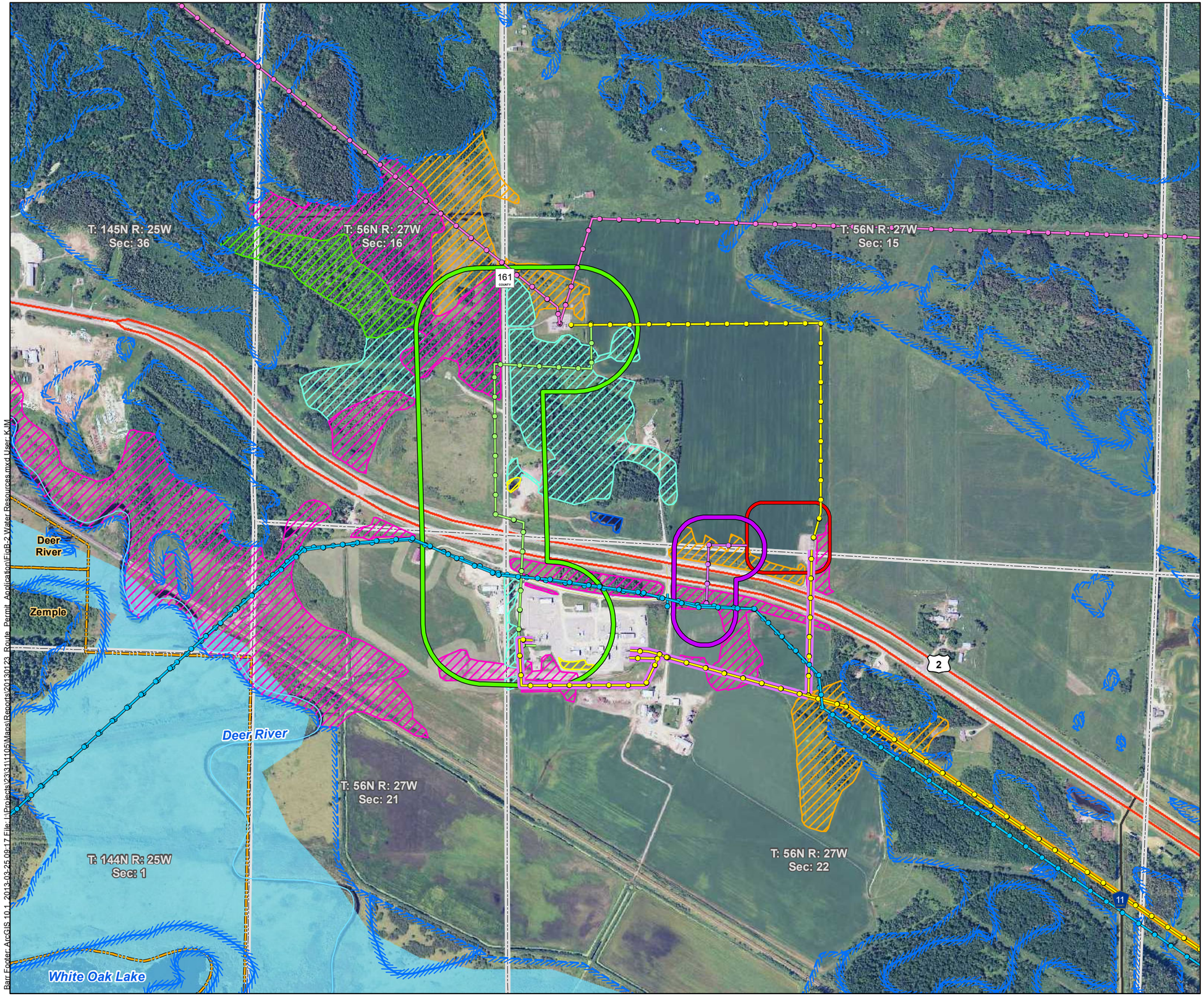
N

0 375 750 1,500 Feet

Figure B-1

ENVIRONMENTAL AND CULTURAL RESOURCES
Proposed 115 kV, 230 kV HVTL and Substation
Minnesota Power
Itasca County, MN

Barr Footer:ArcGIS 10.1 2013-03-25 09:08 File: I:\Projects\23\3111105\Maps\Reports\20130123_Route_Permit_Application\FigB-1 Environmental and Cultural Resources.mxd User: KJM



Existing 115kV Line
Existing 69kV Line
CapX2020 230kV Line
115 kV HVTL Proposed for Removal
Proposed 115 kV Rebuild
Proposed 115kV Alignment
Proposed 115 kV HVTL Route
Proposed 230kV Alignment
Proposed 230 kV HVTL Route
Proposed Substation Location
PWI Watercourse
PWI Basin
PLS Section
Municipal Boundary
NWI Wetland

Barr Wetland Determination

Eggers & Reed Wetland Types

Coniferous Swamp
Hardwood Swamp
Sedge/Wet Meadow
Shallow Marsh
Shallow, Open Water
Shrub Swamp

Image Source: 2010 Farm Service Agency

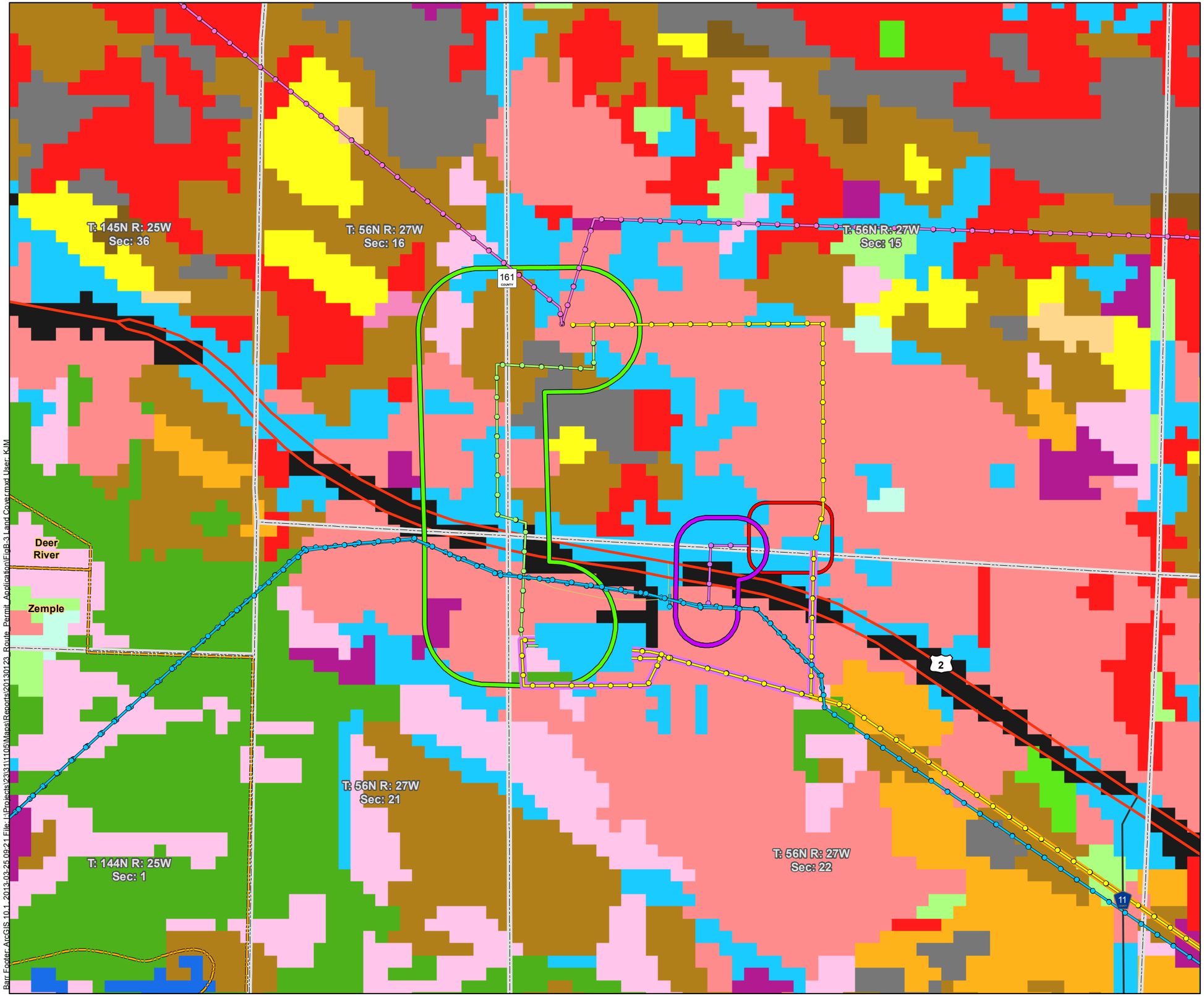
N

0 375 750 1,500 Feet

Figure B-2

WATER RESOURCES
Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

Barr Footer: ArcGIS 10.1, 2013-03-25 09:17 File: I:\Projects\23\31\11105\Maps\Reports\20130123_Route_Permit_Application\FigB-2 Water Resources.mxd User: KJM



Barr Footer: ArcGIS 10.1, 2013-03-25 09:21 File: J:\Projects\23\31\1105\Maps\Reports\20130123_Route_Permit_Application\FigB-3 Land Cover.mxd User: KJM

Existing 115kV Line
Existing 69kV Line
CapX2020 230kV Line
115 kV HVTL Proposed for Removal
Proposed 115 kV Rebuild
Proposed 115kV Alignment
Proposed 115 kV HVTL Route
Proposed 230kV Alignment
Proposed 230 kV HVTL Route
Proposed Substation Location
PLS Section
Municipal Boundary

Land Cover*

Aspen/White Birch
Black Ash
Broadleaf Sedge/Cattail
Cropland
Grassland
Lowland Black Spruce
Lowland Conifer-Deciduous mix
Lowland Deciduous
Lowland Deciduous Shrub
Lowland Northern White-Cedar
Maple/Basswood
Sedge Meadow
Tamarack
Transportation
Upland Deciduous
Upland Northern White-Cedar
Upland Shrub
Water

* USGS National Gap Analysis Program

N

0 375 750 1,500 Feet

Figure B-3

LAND COVER
Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

APPENDIX C

LANDOWNER LIST

Landowner List
Minnesota Power - Deer River HVTL Project

Owner
Anita Erickson
Calvin & Linda Mickle
Christine Mann
Clifford & Michelle Kuck
David & Kristina Schmidt
David & Tammy Evans
David Leen
David Ortloff Jr
DS Enterprises of Cohasset
Eileen Feltus
Enbridge Energy
Enbridge Energy, LP C/O Duff & Phelps
Gene Smith
Gerald Balling
Great River Energy
Joseph Villeneuve
Lawrence Otto
Linnea Novicki
Mark & Dawn Leen
Mark & Susan Wohlrabe
Minn Power & Light Co.
Minnesota Department of Transportation
Peter Berbee
Richard & Kristi Armstrong
Richard & Laurie Shadley
Richard and Lori Brink
Ronald & Denise Feltus
Sirjord's Back 40, LLC C/O Jeffery Sirjord
Susan Best
The Wisconsin Power Inc Sys
Thelma Brink
Wolfgang Jack Littlewolf

APPENDIX D

LGU NOTICE LETTER

minnesota power
AN ALLETE COMPANY
30 west superior street / duluth, minnesota 55802-2093 / fax: 218-723-3955 /www.allete.com

November 12, 2012

Itasca County Environmental Services
Don Dewey
Environmental Services Administrator
123 NE 4th St.
Grand Rapids, MN 55744

RE: Minnesota Power's Proposed High Voltage Transmission Lines and Substation

Dear Mr. Dewey,

Minnesota Power is proposing the construction of a 0.7 mile 115 kV high voltage transmission line (HVTL), a 0.2 mile 230 kV HVTL and a substation rebuild (Project) within Itasca County, Minnesota. Minnesota Power will be seeking a route permit for the Project through the Minnesota Public Utilities Commission utilizing the alternative route permitting process under Minn. Stat. § 216E.04. This letter serves as notice of the proposed Project to each local unit of government that is within the proposed HVTL route.

The proposed Project is located within the local jurisdiction of Itasca County. The proposed 115 kV HVTL originates at an existing Enbridge substation and terminates at an existing GRE Substation located north of Highway 2. The proposed 230 kV HVTL would tap an existing 230 kV HVTL and terminate at Minnesota Power's proposed rebuilt substation north of Highway 2 (see attached route map).

If interested, I would be happy to meet and further discuss the proposed project with you. I can be reached at (218) 355-3515 or electronically at dmccourtney@allete.com. Thank you for your attention to this matter.

Best regards,

Daniel McCourtney
Minnesota Power
Siting and Permitting

Enc.

APPENDIX E

OPEN HOUSE NOTICE LETTER, CONTACT LIST, AND ATTENDEES

Agency Contact List
Minnesota Power - Deer River HVTL Project

Agency	Contact Name	Title	City	State
City of Deer River	John O'Brien	Mayor	Deer River	MN
Deer River Municipal Airport	Kenneth Reichert	Airport Manager	Deer River	MN
Itasca County Administration	Trish Klein	Itasca County Administrator	Grand Rapids	MN
Itasca County Board of Commissioners	Davin Tinqust	District 1 Commissioner	Grand Rapids	MN
Itasca County Environmental Services	Don Dewy	Environmental Services Administrator	Grand Rapids	MN
Itasca County Environmental Services	Mary Jo Davis	Assistant Solid Waste	Grand Rapids	MN
Itasca County Environmental Services	Dan Swenson	Assistant Planning, Zoning, Sanitiation	Grand Rapids	MN
Itasca County Historical Society	Leona Litchke	President of the Board of Directors	Grand Rapids	MN
Itasca County Land Department Park System	Roger Clark	County Park System Manager	Grand Rapids	MN
Itasca County Soil and Water Conservation	Chuck Isaacs	SWCD Supervisors Chairman, District 1	Grand Rapids	MN
Itasca County Soil and Water Conservation District	Matt Johnson	SWCD Wetland Specialist, Itasca Co. WCA Contact	Grand Rapids	MN
Itasca County Soil and Water Conservation District	Jim Gustafson	SWCD District Manager, Itasca Co. WCA Contact, Local Water Planning Contact for Itasca County	Grand Rapids	MN
Itasca County Soil and Water Conservation	Marge Sella	NRCS District Conservationist	Grand Rapids	MN
Itasca County Land Department, Minnesota Department of Agriculture	Garrett Ous	Itasca County Land Commissioner, Minnesota Department of Agriculture Itasca County Inspector	Grand Rapids	MN
Minnesota Department of Natural Resources Ecological and Water Resources - Northeast	Pat Collins	Regional Manager	Grand Rapids	MN
Minnesota Department of Natural Resources	Lisa Joyal	Natural Heritage Review Coordinator	Saint Paul	MN
Minnesota Department of Transportation - District 1	Beth Petrowske	Public Affairs Coordinator	Duluth	MN
Minnesota Department of Transportation - District 1	Duane Hill	District Engineer	Duluth	MN
Minnesota Pollution Control Agency Northeast Region Office	Suzanne Hanson	Duluth Region Manager	Duluth	MN
Minnesota Public Utilities Commission	Dr. Burl Haar	Executive Secretary	Saint Paul	MN
Minnesota State Historical Preservation Office	Mary Ann Heidemann	Manager of Government Programs and Compliance	St. Paul	MN
U.S. Army Corps of Engineers - St. Paul District, Northeast Section	Bill Sande	Chief	St. Paul	MN
U.S. Fish and Wildlife Service - Twin Cities	Tony Sullins	Field Supervisor	Bloomington	MN

Landowner Contact List
Minnesota Power - Deer River HVTL Project

Owner	City	State
Richard & Kristi Armstrong	Deer River	MN
Gerald Balling	Bovey	MN
Peter Berbee	Deer River	MN
Susan Best	Cohasset	MN
Richard and Lori Brink	Deer River	MN
Thelma Brink	Grand Rapids	MN
DS Enterprises of Cohasset	Cohasset	MN
Enbridge Energy	Houston	TX
Enbridge Energy, LP C/O Duff & Phelps	Plano	TX
Anita Erickson	Deer River	MN
David & Tammy Evans	Deer River	MN
Eileen Feltus	Deer River	MN
Ronald & Denise Feltus	Deer River	MN
Great River Energy	Maple Grove	MN
Clifford & Michelle Kuck	Deer River	MN
David Leen	Deer River	MN
Mark & Dawn Leen	Burnsville	MN
Wolfgang Jack Littlewolf	Minneapolis	MN
Christine Mann	Deer River	MN
Calvin & Linda Mickle	Deer River	MN
Minn Power & Light Co.	Duluth	MN
Linnea Novicki	Deer River	MN
David Ortloff Jr	Deer River	MN
Lawrence Otto	Bemidji	MN
David & Kristina Schmidt	Taconite	MN
Richard & Laurie Shadley	Deer River	MN
Sirjord's Back 40, LLC C/O Jeffery Sirjord	Hibbing	MN
Gene Smith	Hutchinson	KS
Minnesota Department of Transportation	Saint Paul	MN
The Wisconsin Power Inc Sys	Sun Prairie	WI
Joseph Villeneuve	Deer River	MN
Mark & Susan Wohlrabe	Deer River	MN

minnesota power / 30 west superior street / duluth, minnesota 55802-2093 / 800-228-4966 / www.mnpower.com

December 7, 2012

Recipient Address

Re: Notice of Proposed High-Voltage Transmission Line Project and Public Meeting: Minnesota Power Deer River HVTL Project

Dear ___:

Minnesota Power is proposing to build 0.7 mile 115 kV high voltage transmission line (HVTL), a double circuit 0.2 mile 230 kV HVTL, and a substation near Deer River, MN in order to serve growing industrial load in the Deer River area. This project will complete a circuit in the project area, improve electrical service and allow for the removal of approximately seven miles of existing 115 kV line east of the project site between Deer River and Cohasset. Figure 1 and Figure 2 (enclosed) provide an overview of the proposed project area.

The purpose of this letter is to provide you notice of Minnesota Power's intent to apply for a Route Permit from the Minnesota Public Utilities Commission (Commission) for the proposed project and to invite you to attend an open house for the project that will be held in the project area on Monday January 7, 2013. We would like to gain your input and keep you informed as we evaluate routing information and work through Minnesota's transmission line route permitting process. After hearing from you and other affected parties, we intend to apply for a Route Permit from the Commission by late February, 2013.

THE PROJECT

The proposed project consists of the following:

- 115 kV HVTL: This 0.7-mile long 115 kV HVTL would extend from an existing substation north of US Hwy 2 to an existing industrial facility substation south of US Hwy 2;

- 230 kV HVTL: This 0.2 mile long HVTL would tap an existing 230 kV HVTL south of US Hwy 2 and extend to the proposed substation site north of Hwy 2;

- Substation: A new 230 kV substation will be constructed at the north end of the proposed 230 kV HVTL on an existing 115 kV substation site;

- 115 kV HVTL removal: Seven miles of existing 115 kV HVTL will be taken out of service and removed.

The proposed project is located just east of the City of Deer River, MN near existing industrial land use, commercial development and some residential land. The proposed routes will cross US Hwy 2, and depending on the final route selected, the 115 kV portion of line may cross wetland areas.

PERMITTING REQUIREMENTS

The proposed project qualifies as a HVTL under Minnesota Rules Chapter 7850.1000, subp 9 and will require a Route Permit from the Commission. Due to the project's length and voltage, however, it will be exempt from requiring a State of Minnesota Certificate of Need and will qualify for the Alternative Review process for the Route Permit (Minnesota Statutes 216E.04). Through the Route Permit process the Commission will consider environmental and human impacts and draw on input from stakeholders including the applicant (Minnesota Power), state and federal agencies, local government officials, landowners, and other interested parties to determine the final location of the proposed facilities.

PUBLIC OPEN HOUSE SCHEDULED

Minnesota Power will be holding a public open house at the **White Oak Inn and Suites located at 201 4th Ave NW, Deer River, MN 56636 on Monday January 7, 2013 from 6:00PM to 7:30PM** to provide project information and gain stakeholder input. At the open house, we will have maps and information on preliminary routes, structure types, right-of-way, the permitting process and other issues of interest. Please join us so you can provide your input and ask questions. You are welcome at any time during the hours of the open house. If you cannot attend but would like to share your input or obtain more information, please contact me at the number shown below and we will send you information or have a Minnesota Power representative arrange to speak with you. You are welcome at any time during the hours of the open house.

MINNESOTA POWER ROUTE PERMIT CONTACT

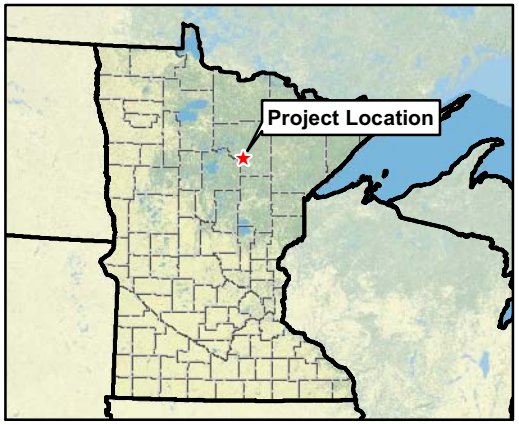
Daniel McCourtney
ALLETE/Minnesota Power, Siting & Permitting Department
30 West Superior St.
Duluth, MN 55802
(218) 355-3515
dmccourtney@allete.com

I appreciate your assistance with this process. Thank you for your time.

Sincerely,

Daniel McCourtney
Minnesota Power
Siting and Permitting

Enclosures: Figure 1 & Figure 2



115 T-Line to remove

Proposed 115

Proposed 230

PWI Watercourse

PWI Basin

Proposed Sub Location

PLS Section

Municipal Boundary

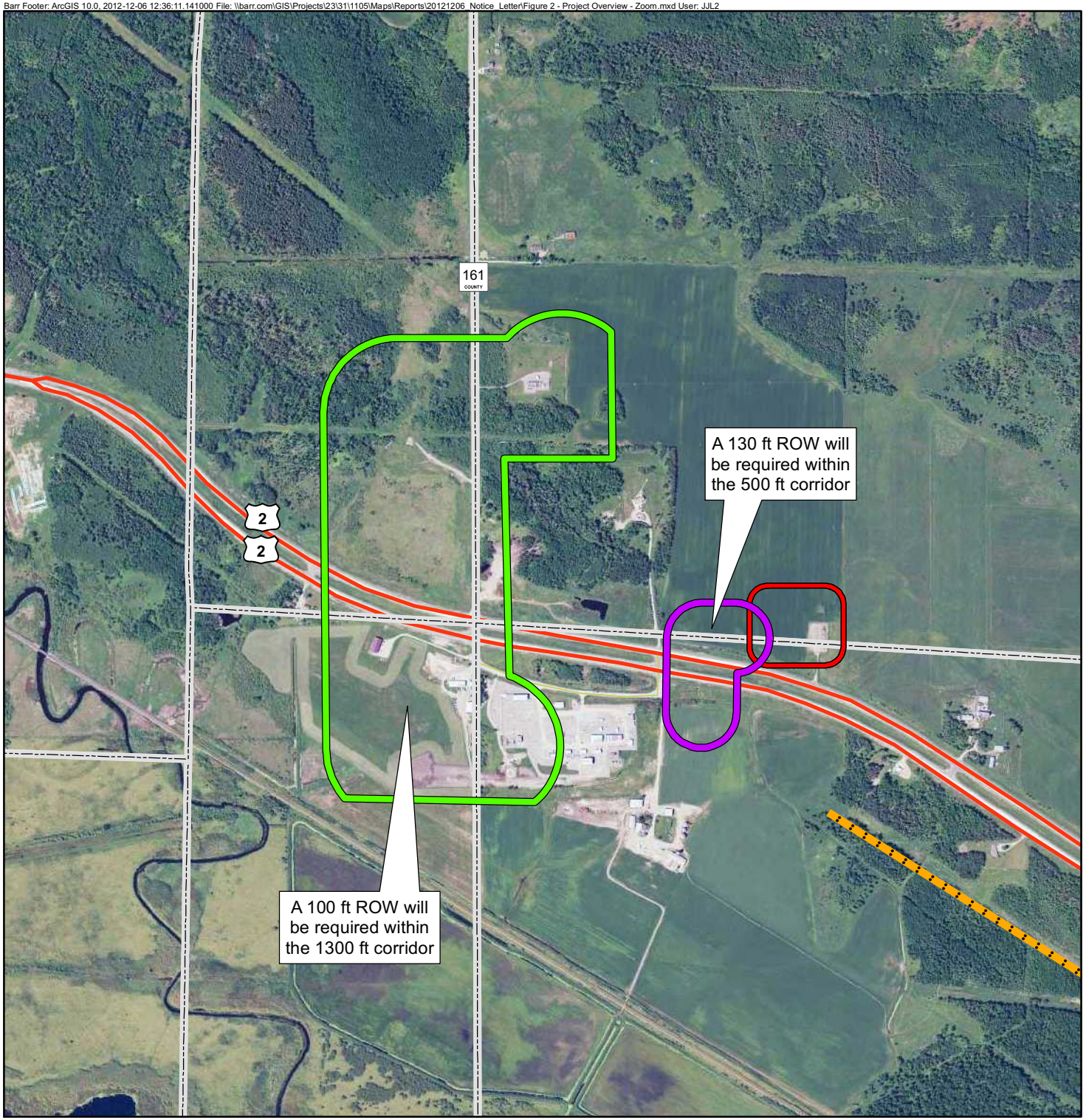
County Boundary

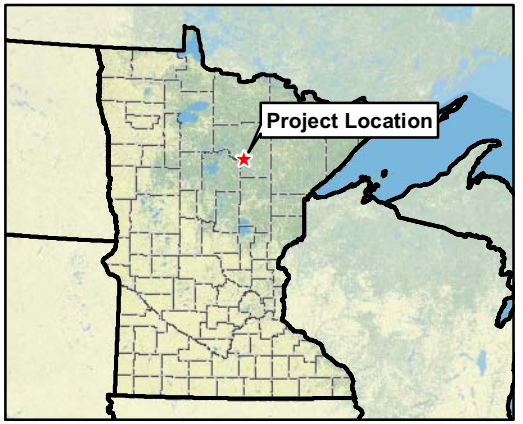
Image Source: 2010 Farm Service Agency

0 0.5 1 2 Miles

Figure 1 - PROJECT OVERVIEW

Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN





115 T-Line to remove

Proposed 115

Proposed 230

Proposed Sub Location

PLS Section

Image Source: 2010 Farm Service Agency

N

0 500 1,000 2,000 Feet

Figure 2 - PROJECT DETAILED MAP

Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

1/7 Deer River Project Open House

Name	Phone Number (Optional)
CALVIN MICKLE	
Susan Wohlmbe/ DR Bibs Htg.	
Linda L Jackson	
Jim Gustafson	
WES TROUT	

Minnesota Power Hosting Public Open House for Proposed Deer River Transmission Line Project

Monday, January 7, 2013, 6:00PM - 7:30PM White Oak Inn and Suites, 201 4th Ave NW, Deer River, MN 56636

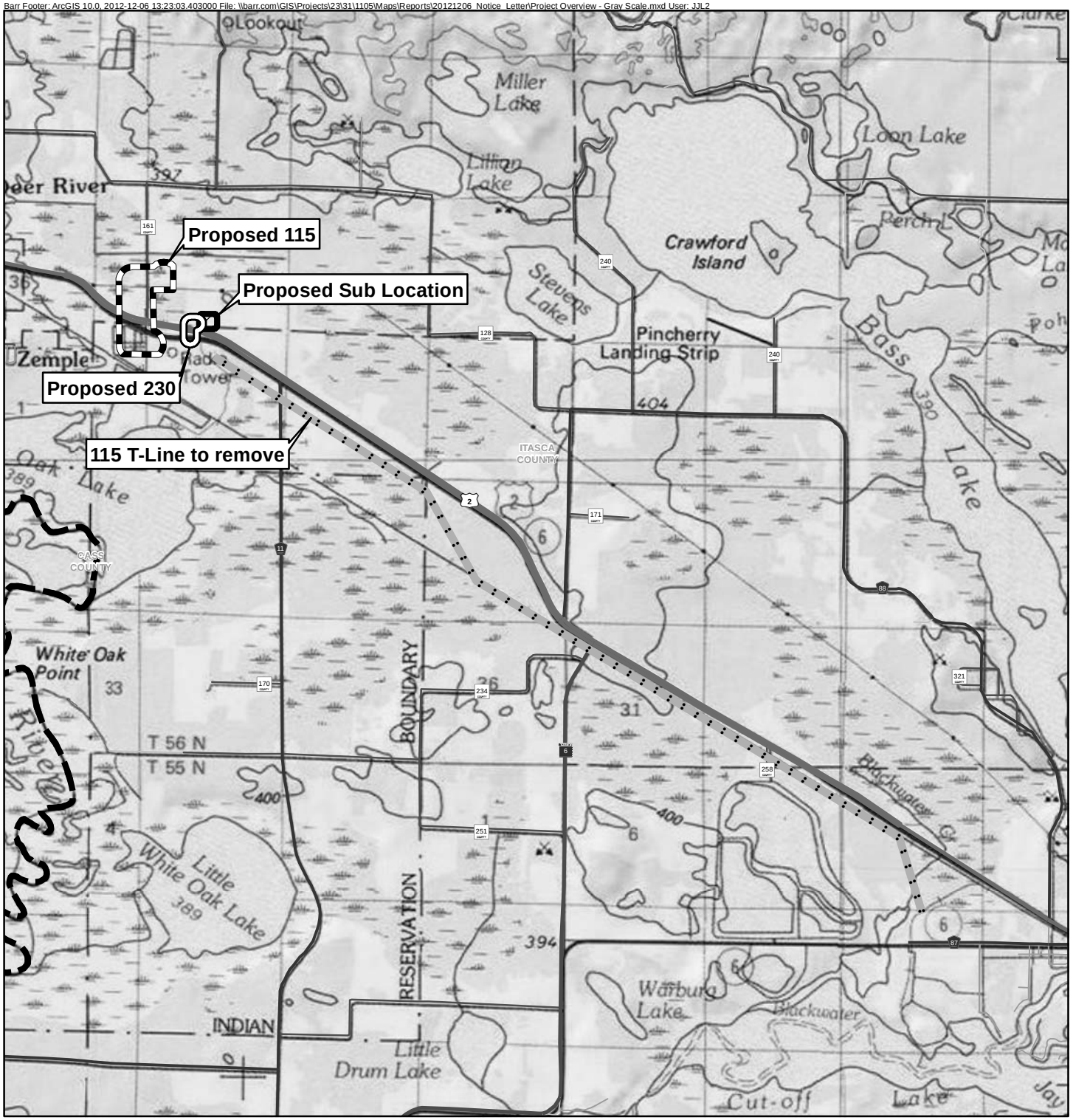
Project Description

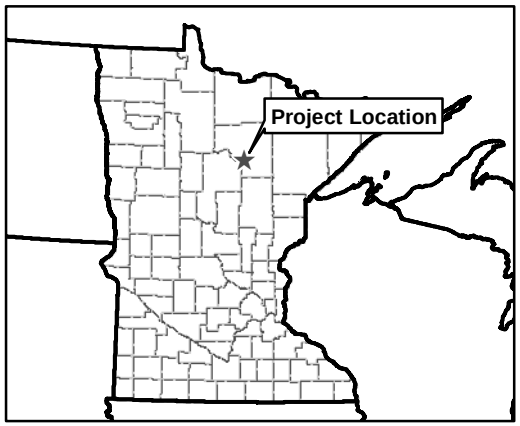
Minnesota Power is hosting a public information open house on a proposed transmission line project in Itasca County near the City of Deer River. To accommodate projected industrial load growth, Minnesota plans to construct an approximate 0.7 mile 115 kilovolt (kV) high voltage transmission line (HVTL), an approximate 0.2 mile 230 kV HVTL and substation. This project will improve electrical service and allow for the removal of approximately 7 miles of existing 115 kV HVTL east of the project site between Deer River and Cohasset.

The community's views about the project are important to Minnesota Power. Project maps and information on the proposed construction location, structure types, right-of-way and the permitting process will be available at the open house. Project staff will also be available to answer questions and provide information on how to participate in the state route permitting process. You are welcome to attend anytime during the hours of the open house. If you cannot attend but have input on the proposed project, please contact Daniel McCourtney, Environmental Siting and Permitting, at (218) 355-3515 for project information.

Minnesota Power Contact:

Daniel McCourtney
Environmental Siting and Permitting
ALLETE/Minnesota Power
30 West Superior Street
Duluth, MN 55802
(218) 355-3515





115 T-Line to remove

Proposed 115

Proposed 230

Proposed Sub Location

County Boundary

Topo Source: USGS, National Geographic Society, i-cubed

N

0 0.5 1 2 Miles

PROJECT OVERVIEW

Proposed 115 kV, 230 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

APPENDIX F

SHPO LETTER

Minnesota
Historical Society

STATE HISTORIC PRESERVATION OFFICE

December 24, 2012

Mr. Daniel McCourtney
Siting & Permitting Department
ALLETE/Minnesota Power
30 West Superior Street
Duluth, MN 55802-2093

RE: Minnesota Power Deer River HVTL Project: construct a .7-mile 115 kV transmission line, a .2-mile 230 kV line, and a substation; remove 7 miles of existing line between Deer River and Cohasset
Itasca County
SHPO Number: 2013-0833

Dear Mr. McCourtney:

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to the responsibilities given the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

Based on our review of the project information, we conclude that there are **no properties** listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, Procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal permit or license, it should be submitted to our office by the responsible federal agency.

Please contact our Compliance Section at (651) 259-3455 if you have any questions regarding our review of this project.

Sincerely,

Mary Ann Heidemann, Manager
Government Programs and Compliance